James D. McCawley, *The syntactic phenomena of English*,
vol. 1, 3nd printing: ERRATA

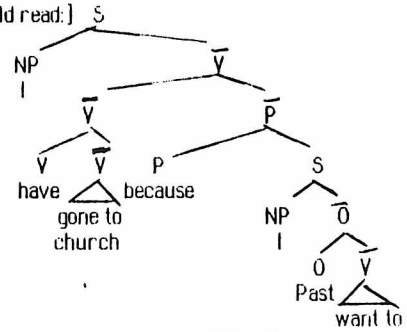
page, line	in place of	read instead
8, 6 below (4)	the potatoes	[italicize]
31, (2b)	[upper "Past"]	Pres
73, note 6, line 4	*her*	*Mary*
78, 5 of par. 2	(2b)	(2b')
79, (8a)	where	were
80, 4 below (10)	*to*	[delete]
83, 2 above (17)	(iia)	(iib)
last line	(17)	(18)
84, 2	(17)	(18)
102, 4 above (8)	*John* (2x)	*me*
106, line 5	odreal	ordeal
113, last line	of	[delete]
140, 7 below (7)	the the	the
149, note 8	[change first sentence to read:]	

It is not clear that S-nodes whose subjects have been removed (e.g. S_3 in the last tree of (10)) should remain in the structure.

150, note 16, i	genie	génie
157, 5 from bottom	respected. And	respected; and
166, 4 of par. 2	derivation	deviation
178, ex.5, line 3	Affix-hopping	Tense-hopping
206, note 11, line 5	showing	having some of the
212, (12)	may	must
213, 2nd tree	may	must
215, 1 above (15)		adverbs adverbials
216, 1	adverbs	adverbials
229, 1 above (1)	tense	tensed
239, next-to-last tree	NP [at right end]	$\bar{V}$
241, 1 below (5)	anlysis	analysis
248, (7c)	[the bracket should come before "also"]	
252-3, (5)	ago [4x]	before

255, par. 2 [first sentence should read:] Omitting the obvious steps of Comp-placement$_8$, Equi$_7$, Raising$_{6,4}$, and Tense-replacement$_4$, we come to S_3, on which $\bar{V}$-deletion and the rule ...

255, (7) [should read:]



258, note 7, last line	VP	VP node
259, note 18, line 3	terms	tenses
267, line 2	be	[delete]
270, 3 above (26)	structures	such structures
273, (2a)	does't	doesn't
275, 4 from bottom	(8a)	(7a)
286, (4g)	*felt sick*	*I felt sick*

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page, line	in place of	read instead
286, exercise 6, line 5	Conside	Consider
288, line 4	(18a,	(18a:
293, 3 above (6)	V	$\bar{V}$
1 below (6)	when the	when that
295, 12 from end of par. 1	*b*	*be*
last line	would	could
296, 5 from bottom	**be given the money**	[italic, not bold]
304, 7 from bottom	(20b)	(21b)
306, 1 below (25)	a',	[delete]
307, below (27)	[this passage should read:]	

In (27a), *considering* is at the end of a relative clause. In (27b), *sleeping* is a modifier. And in (27c), *getting* is the main verb not of the complement of *have* but of a still more...

2 from end of that paragraph	i.d.	i.e.
308	(28)	(29)
	(29)	(30)
311, 2 above (9)	(6a)	(7a)
316, ex. 2a, line 3	east	least
ex. 8	[change to:]	

For any one type of complement S in the language other than English, that you know best, construct examples that will test whether it is subject to Kuno's version of the Internal S Constraint.

319, 4	takes it	takes its
328, 1 below (3)	along	among
332, 3 above (11)	lefy	left
338, par. 2, line 3	X^2 to X^1	X^1 to X^2
342, 4 below (19)	S-modifier	V-modifier
(20a)	[add another] at the end]	
344, (24a)	60	82
349, 5 from end of par. 1	(37)... S_{i+1}	(36)... S_2
352, 2 below (3)	as they would have to	which they could not be
355, 3 above (10)	qualifier	quantifier
357, (6a)	picture	pictures
361, exercise 4, 1	(33)	(32)
363, 1 below (i)	is the AD that	[delete]
364, note 8, 4	indentifiable	identifiable
xxxiv, line 4	Unger	Unger ,
xl, Bresnan	512	521
xli, Degree expression	196	193
xliii, German	573, 580, 752 n.2	574, 583, 751 n.2
xliv, Internal S constraint	[add:]	470
Jaworska	365 n. 15	317 n. 4
Kuno	364	365
xlv, Lexical decomposition	[add:]	203, 662 n. 14 16
Logophoric clause	364	365
xlvi	[add:]	Particle, 64-66, 72-73ex5
Passive	[add:]	224-25
xlvii, Right-node-raising	573	673
xlviii, Strict cyclicity	[add:]	257ex9
Super-equi [add:]		151 n. 22

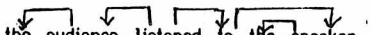
2. Overview of the scheme of syntactic analysis adopted below

a. The conception of syntactic structure

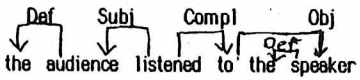
The syntactic analyses to whose exposition and justification the bulk of this book is devoted are in terms of a particular conception of syntactic structure. Different traditions of syntactic analysis have in fact operated in terms of quite different conceptions of syntactic structure. For example, in "traditional grammar" (an informal term that takes in the Greco-Roman tradition and its medieval and modern descendants, including many of the pedagogical grammars still in use), the structure of sentences was given in terms of relations of various kinds of "dependency" between the **words** that made up the sentence, as in an analysis of (1a) such as is represented in (1b) or (1c):

(1) a. The audience listened to the speaker.

b.



c.

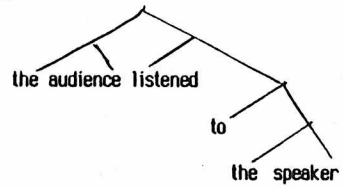


The arrows indicate that the word at the head of the arrow is dependent on the word at the tail of the arrow, e.g. that the first occurrence of *the* is dependent on *audience* and that *audience* is dependent on listen; (1b) represents "pure dependency structure": it indicates what word each word depends on without distinguishing among different kinds of dependency relation. Since traditional grammar normally distinguished many kinds of dependency, analyses within that tradition are more faithfully represented by diagrams with labeled arrows, as in (1c), which indicates that the first *the* "defines" *audience*, that *audience* is the subject of *listened*, etc.

In (1), units larger than a word play no role, e.g. the subject of *listened* is *audience* and not *the audience*, and *audience* is the subject of *listened*, not of *listened to the speaker*. While some versions of traditional grammar recognized certain units larger than words (especially units such as "clauses"), it was not until the early 20th century that approaches to syntax which fairly systematically recognized such units gained much currency. Due to the influence of Leonard Bloomfield (1887-1949), whose ideas on syntax in turn strongly reflected those of the

psychologist Wilhelm Wundt (1832-1920), most schools of linguistics in North America have operated in terms of conceptions of syntactic structure as organized around the notion of **constituency**, that is, a relationship of part to whole, as when one treats (1a) as made up of two parts, *the audience* and *listened to the speaker*, with the former made up of *the* and *audience* and the latter made up of *listened to the speaker*, and *listened to the speaker* made up of *listened* and *to the speaker*, etc., as one might represent in a diagram such as (2), where a line segment represents that the unit at its lower end is an **immediate constituent** of the unit at its upper end:[1]

(2)

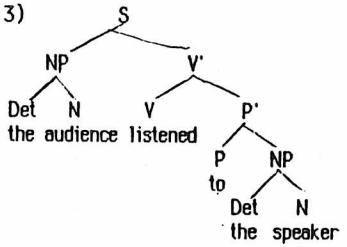


[1]Alternatively: that the first *the* and *audience* make up a unit, that the second *the* and *speaker* make up a unit, that *to* and *the speaker* make up a unit, etc.: it is immaterial whether we view the "constituency" relation "from the bottom up" or "from the top down").

In a diagram such as (2), what is intended to be significant is which **nodes** the line segments connect, indicating that syntactic units corresponding to those nodes stand in the syntactic part-to-whole relationship, and the left-to-right arrangement of the nodes, which indicates the **linear order** of the corresponding units (e.g. the first *the* precedes *audience*, *the audience* precedes *listened* and also precedes *listened to the speaker*).[2] An additional aspect of the structures that will figure in the analyses below is the **categories** of the various units: whether expressions can be put together in various syntactic constructions will depend, among other things, on what categories they belong to. There is in fact no consensus among linguists on questions of what syntactic categories there are and what units belong to each, and it will not be until chapter 7 that we will have gone through enough syntactic analyses to really be able to evaluate possible answers to these questions. For the sake of having something concrete to work with in the earlier chapters of this book, I will adopt a simplified version of the conception of syntactic categories that will be argued for in chapter 7 and will attach corresponding labels to the

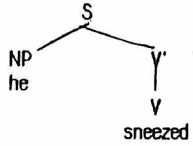
units in my syntactic structures, sometimes in what may seem like an arbitrary way, but with the understanding that in chapter 7 issues of categorization will be discussed seriously and the category labels that figure in chapters 2-6 will be put on a firmer footing. For the purposes of chapters 2-6, let us assume that there will be two sorts of syntactic categories. One sort will be the syntactic reflections of categories of logic, e.g. the syntactic category S ("sentence" or "clause") is the syntactic counterpart to the semantic category "proposition" and the syntactic category that is commonly but misleadingly called NP (an expression such as *she* or *that woman over there* that can serve as the subject or object of a verb or as the object of a preposition) is the syntactic counterpart of the semantic category "argument of predicate", i.e. something of which a property is predicated.[3] The other sort, illustrated by V ("verb"), P ("preposition")[4], V' ("verb phrase"), and P' ("preposition phrase")[5], reflects parts of speech and the difference between a word unit and a **phrasal** unit: a unit consisting of a word plus whatever "objects" or "complements" it may have. V' (read "verb phrase" or "V bar") means a phrasal unit whose **head** (the item on which the other parts of the unit are dependent) is a verb, and in (2), *listened to the speaker* is a V' because it is a phrasal unit and its head (*listened*) is a V; similarly, *to the speaker* is a P' because it is a phrasal unit and its head (*to*) is a P. The units that here are called NPs are phrasal units, but it is highly controversial whether their head is the noun or the "determiner" (an article such as *the* or a quantifier such as *every*), and neutrality will be maintained on that issue throughout much of this book. The symbol N' (i.e. phrasal unit with noun as head) will in fact figure in analyses later in the book, but it will be appropriate to use this symbol not for expressions such as *the audience* or *every speaker* but for expressions such as *theory of light* or *attack on Kuwait* that may in turn be combined with a determiner into an expression of the category that is here called NP. Adding category information to the information about constituent structure and linear order that is given in (2), we obtain (3) as a more complete representation of the syntactic structure of our example sentence:[6]

(3)



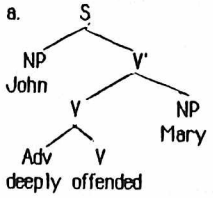
The use of the term "phrasal unit" deviates in important respects from the common use of "phrase" to denote an expression that consists of two or more words. When a predicate element has no objects or complements, as in a sentence such as *He sneezed*, there is still a phrasal unit that consists of that element:

(4)

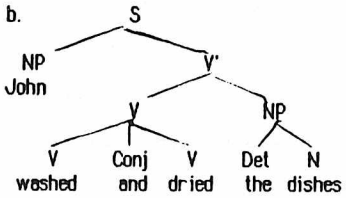


There are also cases in which an expression of more than one word will belong to a word category rather than to a phrasal category, because (as will be argued below) modification and conjoining are transparent with regard to category, that is, a modifier yields an expression of the same category as what it modifies, and conjoining expressions of any category yields an expression of that category. Thus, in (5a), in which the adverb modifies the verb, *deeply offended* is a V and not a V', and in (5b), in which verbs are conjoined, *washed and dried* is likewise a V and not a V':

(5) a.



b.



These policies about categorization reflect respects in which the properties of "phrasal units" that will be identified below are shared by one-word elements that have no objects or complements, but not by multi-word combinations such as *deeply offended* and *washed and dried* that combine with an object into a V'; for example, the expressions that are identified here as V's can be conjoined with a V' and those that are identified here as Vs can be conjoined with a V, but not vice versa:

(6) a. John [held his hands over his nose and sneezed].

b. John [insulted and deeply offended] Mary.

b'. *John [deeply offended and insulted Bill] Mary.

A number of other aspects of syntactic structure will play some role in the analyses to be presented below, most notably:

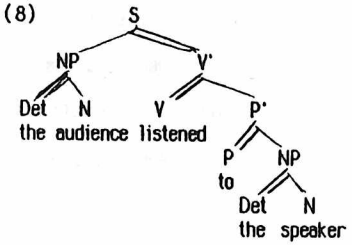
(7) a. **Dependency** relations, i.e. the relation of an item to another item on which it is "dependent", e.g. an item that it "modifies" or of which it is a complement or an object.

b. **grammatical relations**, such as "is the subject of" and "is the direct object of"; and

c. **anaphoric relations**, i.e. the relation of a pronoun to its antecedent.

One can alter diagrams such as (3) in a way that will display dependency relations perspicuously, while preserving the use of lines to represent constituency and left-right orientation to represent linear order, namely by using double lines (as in Déchaine 1993) to indicate the connection between a unit and its head, e.g. between a V' and the V that figures in it. If we take the position that a subject is dependent on the V' that it is combined with and (for sake of concreteness — I still wish to maintain neutrality) that the head of a NP is the determiner, we obtain the following more detailed version of (3):

(8)



Grammatical relations are represented at most indirectly in (3): it is only in virtue of our knowledge of a generalization about English (namely that when a S consists of a NP and a V', the NP is the subject of the V of the V') that we can infer from (3) that *the audience* is the subject of *listened*. Subjects in fact do not always stand in the syntactic configuration illustrated in (3); for example, one can reasonably claim that *John* is the subject of *drunk* and *the table* is the subject of *clean* in (9):

(9) a. John once gave a lecture drunk.

b. Bill wiped the table clean.

No specific graphic device for representing grammatical relations or anaphoric relations will be proposed here; if the need for representing these relations in structure diagrams arises, we are free to introduce ad-hoc notations according to our need.

The various details of the structures to be presented will require justification, that is, a case will have to be made for recognizing those structures rather than alternative structures that might be proposed. If we are to assign to the sentence *The audience listened to the speaker* the structure represented in (3), we must be prepared, for example, to show that *listened to the speaker* behaves as a syntactic unit in that sentence and that *the audience listened* (which is represented in (3) as **not** being a unit) does not. Chapter 3 will be devoted largely to the question of how particular constituent structures can be argued for or against. The critical discussion of the notion of syntactic category that comprises chapter 7 will provide a partial answer to the question of how one can provide content to category notions such as are indicated by the labels on the nodes in (3), how one can justify recognizing that system or some other system of categories as having significance in syntax, and how one can justify assignments of particular syntactic units to one rather than another category.

The sort of entity that can be represented by a diagram like (3) is known as an **ordered labeled tree**. Readers interested in an explicit characterization of the notion of an ordered labeled tree can consult the set of axioms defining that notion that are given in §2f. For present purposes, though, it will suffice to identify that notion with the information that a diagram like (3) represents: an ordered labeled tree consists of a set of **nodes** (both **terminal** nodes, i.e. nodes that are at the bottoms of "branches" such as the two nodes labeled Det/*the* in (3), and **nonterminal** nodes, i.e. nodes that have other nodes below them, such as the two labeled 'NP' in (3)), along with the relation of **constituency** that the lines represent, the relation of "preceding", indicated by the left-to-right alignment of the symbols on the page, and the category assignments, indicated by category symbols at the various nodes.

b. Multiple syntactic structures; derivations

Transformational grammar abounds in analyses in which a sentence is claimed to have multiple syntactic structures: a **surface structure**, in which the words and morphemes appear in the order in which they are pronounced, grouped in a way that corresponds to ways in which the sentence can be pronounced, and various **underlying structures** that involve units and ways of combining them that do not appear as such in surface structure. For example, there are a number of considerations that argue for setting up underlying structures in which an interrogative expression that appears at the beginning of a question (and which precedes the subject if the interrogative expression is not itself the subject) is not in that position but rather in the position that the corresponding part of an answer to the question would occupy. The interrogative expression in all of the following sentences precedes the subject, except in (1a), in which it is itself the subject:

(1) a. Who put the flowers in the vase?

a'. What did John put in the vase?

a". Where did John put the flowers?

b. What was Jerry looking at?

c. What should we talk about?

d. Which diseases is this drug used in the treatment of?

Again excluding (1a), the examples in (1) all have an **incomplete** predicate constituent, in the sense that sentences with *put in the vase*, etc. as a predicate constituent are usually unacceptable in virtue of lacking something:

(2) a'. *John put in the vase.

a". *John put the flowers.

b. *I wish Jerry would stop looking at.

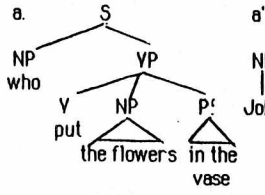
c. *They spent the whole evening talking about.

d. *This drug has only been used in the treatment of.

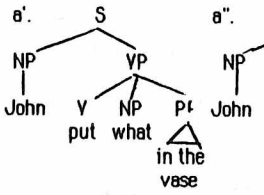
The prepositions of (1b-d) normally require an object, and *put* normally must be combined with both an object NP and a "destination" expression (usually a P'). The interrogative expression corresponds to the missing constituent, in the sense that *what* corresponds to a NP such as the object of *put*, and *where* corresponds to a locative P' such as would serve as the "destination" expression with *put*

The fact that *put* normally is combined with both a NP and a P' but is combined only with a NP in one kind of question and only with a PP in another kind of question, and that other verbs (and nouns, e.g. *treatment* in (1d)) show similar discrepancies between what they are normally combined with and what they are combined with in certain kinds of questions, can be made sense of in terms of an analysis having a level of underlying syntactic structure in which interrogative expressions appear not before the subject but in the positions in which corresponding NPs and P's would normally occur; for example, (1a-a") would have the following underlying structures:

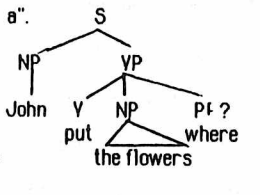
(3) a.



a'.



a".



Positing underlying structures that are distinct from the surface structures of the sentences in question forces us to also posit rules expressing the relationshp between the underlying structures and the corresponding surface structures. Such rules are commonly referred to as **transformations**, in view of the metaphor in which they are spoken of as "operations" that "convert" the underlying structures into "derived" structures. I will indeed adopt much of the terminology that is based on that metaphor, though occasionally interpolating warnings about respects in which the metaphor should not be taken too seriously.

The adoption of underlying structures as in (3) for interrogative sentences such as (1a-a") thus commits us to adopting rules that will relate such underlying structures to corresponding surface structures, thus presumably a transformation that moves interrogative expressions to a position before the subject. We then have an explanation of why the predicate phrases in (1a'-d) are incomplete in the particular ways in which they are: they are complete in underlying structure, and their surface forms are derived by a transformation that makes them incomplete by removing from them an interrogative expression and moving it somewhere else in the structure.

The predicate phrases in (1a'-d) are incomplete in a second respect, though one which in

the case of (1a'-a") is obscured by the use of the verb *put*, whose past tense, past participle, and infinitive forms are identical. Suppose that we replace (1a-a") by similar examples involving a verb for which these forms are mutually distinct:

(4) a. Who took the flowers out of the vase?

a'. What did John take out of the vase?

a". Which vase did John take the flowers out of?

We can now clearly see that the predicate phrase in (4a'-a") lacks the past tense that it would have in a corresponding declarative sentence such as *John took the flowers out of the vase*; moreover, the missing past tense can most plausibly be identified with the tense that appears on *did*. We then have reason for the underlying structure to differ from the surface form in yet another respect: tenses fit into underlying structures the same way irrespective of whether the sentence is declarative or interrogative, and the surface location of the tense in certain interrogative sentences reflects a transformation that moves the tense to a position between an initial interrogative expression and a following subject (note that the tense appears in its "normal" position in (4a), where the interrogative expression **is** the subject and thus is not followed by the subject).

The tense in (1a'-a", 4a'-a") appears on the verb *do*, which is inserted to serve as bearer of a tense that is separated from the verb that would otherwise bear it. This insertion of *do* is regarded as a separate transformation (henceforth, ***Do*-support**) rather than built into the transformation that moves the tense because there are several other syntactic constructions in which a tense becomes separated from a verb that might bear it, and *do* appears irrespective of what is responsible for the tense being without a bearer. In addition, the transformation that moves the tense is not always accompanied by insertion of *do*: it moves an auxiliary verb along with the tense in examples such as (1b-d) in which the tense appears in combination with an auxiliary verb rather than (as in (1a-a")) with a main verb, and in this case there is no insertion of *do*.

For another case in which an incomplete constituent provides an argument for an analysis in terms of an underlying structure with complete constituents and a transformation that makes a

constituent incomplete by removing something form it, consider passive sentences:

(5) a. The Yankees were beaten 3-1 by the Red Sox.

b. The flowers were removed from the vase by the maid.

c. The Wright brothers were laughed at by everyone.

d. Haig's resignation was talked about by many people.

Leaving aside for the moment the auxiliary verb (*was, were*) and the *by*-phrase, we see that the verb in a passive sentence is not combined with the same elements that accompany it in an active sentence:

(6) a. *The Red Sox beat 3-1.

a'. The Red Sox beat the Yankees 3-1.

b. *The maid removed from the vase.

b'. The maid removed the flowers from the vase.

c. *Everyone laughed at.

c'. Everyone laughed at the Wright brothers.

d. *Many people talked about.

d'. Many people talked aboutHaig's resignation.

In the passive sentence, there is a (generally optional) prepositional phrase introduced by *by*, which is not permitted in the active:

(7) a. *The Tigers beat the Yankees 3-1 by the Red Sox.

b. *The butler removed the flowers from the vase by the maid.

However, while what accompanies the verb in the passive is different from what accompanies it in the active, it is not **completely** different. What follows the passive verb is the same as what follows the active verb, but minus one NP and (optionally) plus one P^{t} introduced by *by*. For example, in the active, *put* must be followed by not only a NP but also a "destination" expression (such as *in the vase* or *there*), and the destination expression is as obligatory in the passive as in the active:

(8) a. The maid put the flowers in the vase.

a'. *The maid put the flowers.

b. The flowers were put in the vase.

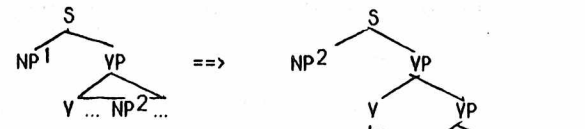
b'. *The flowers were put.

In (5c-d), a preposition (*at, about*) appears without an object, whereas in an active sentence an object is required (see (6b"-b")).

This relationship between what accompanies a V in an active sentence and what accompanies it in a passive sentence can be explained if we posit underlying structures for passive sentences in which a verb is accompanied by exactly the same material that accompanies it in an active sentence, in particular, structures in which the VP is the same as in a corresponding active sentence, and a transformation that removes one NP from the VP and moves it into the subject position. Specifically, let us assume that each verb is provided with a specification of its **valence**, that is, a specification of the syntactic frame(s) in which it can appear.[9] If we take valence as relating to a level of syntactic **deep structure**, that is, a level that is to serve as input to the system of transformations, we will need only to give minimal valence specifications for each verb,[10] e.g. it will suffice to say that *put* appears in the frame [__ NP P'], since it appears in other frames such as [__ NP] and [__ P'] only when transformations remove the P' or NP of the first frame. Bracketed formulas such as [__ NP P'] are a common device for indicating valence specifications; for example, *kick* has the valence [__ NP] and *sleep* the valence [__] (i.e. it makes up a whole VP by itself).[11]

Let us provisionally adopt a treatment of passive clauses in which their underlying structures are identical to those of corresponding active clauses and there is a transformation that optionally converts a structure such as would underlie an active clause into what we will argue in chapter 3 is the constituent structure of a passive clause:[12]

(9)



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One important detail of passive clauses is left unspecified in (9), namely the location of the tense

marker. Since the passive auxiliary *be* bears any tense marker that would be on the main verb in a corresponding active sentence, one might suggest that the transformation in (9) should remove a tense from the V and attach it to passive *be*:

(10) a. Someone threw the letter into the wastebasket.

b. The letter was thrown into the wastebasket by someone.

However, that would be a mistake, because when the tense marker in the corresponding active sentence is on an auxiliary verb, it remains on that verb in a corresponding passive sentence:

(11) a. Someone has stolen the money.

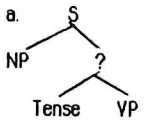
b. The money has been stolen by someone.

The tense is attached to the topmost verb, irrespective of whether that is a main or an auxiliary verb, and it is on a different verb in (10b) than in (10a) because a different verb is the topmost one. This observation provides grounds for adopting deep structures in which tenses are separate from verbs and positing a transformation that attaches the tense to whichever verb is topmost after the application of any transformations such as Passive that change the relative "heights" of verbs in a syntactic structure.[13] The derivation of (10b) will then involve three structures: the deep structure, an intermediate structure derived by application of the passive transformation, and the surface structure, derived from the intermediate structure by application of the transformation that combines tenses with verbs. Many derivations will have more than one intermediate structure. For example, the derivation of (4a') will involve four structures: the deep structure, an intermediate structure derived from it by moving the interrogative expression before the subject, a second intermediate structure derived from the latter structure by **Inversion**, which moves the tense to a position after the preposed interrogative expression, and the surface structure, derived from this last structure by *Do*-support.

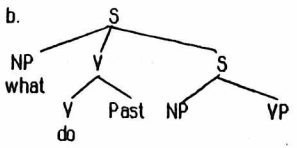
Before displaying these two derivations here, we need first to determine (i) where the tense is in deep structure (all we have said so far is that it is separate from the verb(s), which leaves open many possibilities), and the position in the surface constituent structure of (ii) the interrogative expression and (iii) the form of *do* that is derived by Inversion followed by

Do-support. The answers to these questions that will be argued for in this chapter and the next are (i) that in deep structure the tense combines with a VP into a larger syntactic unit (12a) and (ii) that the interrogative expression and elements moved via Inversion are outside their host S(12b):

(12) a.

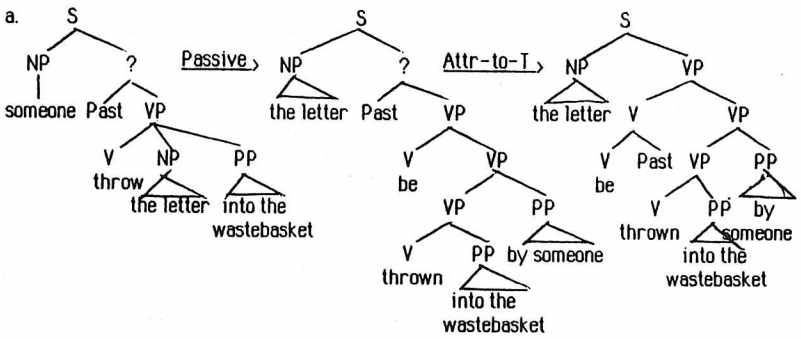


b.

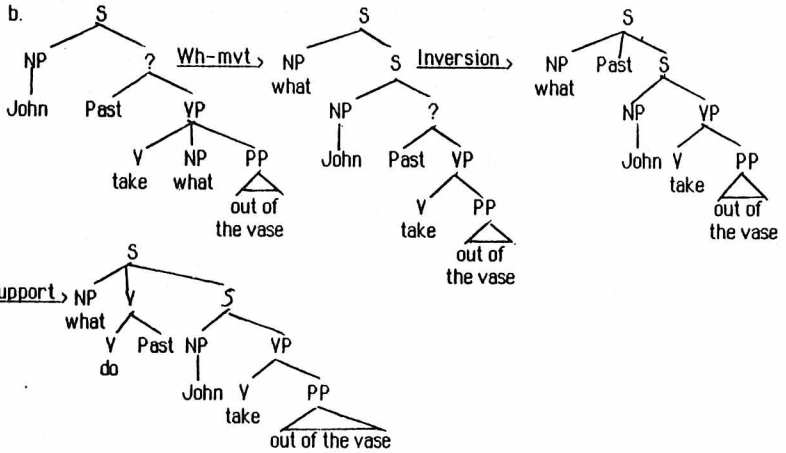


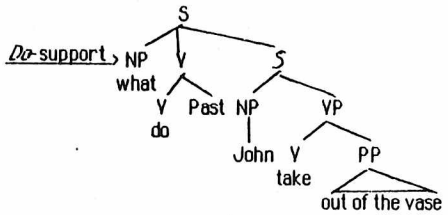
Provisionally adopting these structures in anticipation of the arguments to be given for them below, and using "Attraction-to-tense" as the name of the transformation that combines a tense with an auxiliary verb, we then can give the following as the two derivations sketched above:

(13) a.



b.





The next section will provide considerably more illustrations of derivations, combined with discussion of the important question of what principles determine how steps such are posited in these derivations can combine into complex derivations.

The transformations of a language specify how the various structures in a derivation may or must differ from one another; for example, the transformation of **WH-movement** specifies that if a derivation contains a structure with an interrogative expression in it, a subsequent structure in the derivation must have that interrogative expression outside and to the left of the S in which it occurs in the former structure;[10] this is precisely the way in which the second and third trees in (14) differ. The transformation of **Inversion** specifies that if a derivation contains a structure of the form "interrogative expression plus S," a subsequent structure must have the first auxiliary verb between the interrogative expression and the rest of the S; this is precisely the way in which the third and fourth trees in (14) differ.[11]

Note that these analyses describe only indirectly the constraints on what the various words of English can be combined with in surface structure. Restrictions on the ways in which verbs, prepositions, interrogative expressions, and so forth can combine in surface structure are not stated directly but are consequences of rules that really specify what are **possible derivations.** A VP in surface structure whose verb is *put* sometimes must also contain an object NP and a "destination" expression and sometimes must lack one or other of those expressions. Which situation obtains in a given surface VP is specified indirectly: *put* is required to be accompanied in deep structure by both constituents, and whether the corresponding surface VP contains both or only one of them depends on rules that call for various deep structure constituents to be manifested in surface structure elsewhere than in their deep structure position or (in cases that will be taken up later) to be given no surface manifestation at all.

I will conclude this section with remarks about some metaphors that figure prominently in the terminology and notation that is developed here. The arrow that is commonly used to link the successive stages of a derivation conforms to a popular metaphor according to which transformations are "operations" that "convert" an "input" into an "output." In the chapters that follow, I will in fact frequently use terms like "input" and "output" (e.g., I will speak of the second tree in (14) as the input to WH-movement and the third tree as the output of WH-movement) but will attempt to dissuade the reader from taking the "operation" metaphor too seriously, or from accepting an additional metaphor that carries with it what I regard as false and misleading suggestions, namely, the metaphor that takes the input to a transformation to be "prior to" or "more basic" than "its output and which accordingly takes the deep structure to be "basic" to the entire derivation.

What I regard as particularly objectionable in that metaphor is the idea

that the surface structure and the intermediate stages in the derivation owe their existence to the deep structure that "underlies" them. That suggestion is particularly strong in much of the terminology that has been derived from the "operation" metaphor, as in the term "base rules" for rules that specify what deep structures are possible in the given language. "Base" in such terms as "base rules," "base structures," and "base generated" (none of which is used in this book) suggests the notions of "basic," "fundamental," "foundation," or "that on which everything else rests," and that structures other than deep structures are "derivative," "secondary," etc.

I will maintain below that acceptance of this last metaphor has been responsible for the readiness of many transformational grammarians to accept uncritically a number of ideas that ought to be subjected to critical scrutiny and indeed, as I will argue later, ought to be rejected. Among these are the idea that **combinatoric rules,** that is, rules specifying how units may combine with each other, should relate only (or at least primarily) to the level of deep structure, and the idea that the combinatoric rules for deep structure (the "base rules") should be "complete," that is, that they should enable one to construct the full range of possible deep structures for the given language without reference to other levels of syntactic structure. These ideas are particularly hard to avoid when one accepts a common vulgarization of the "operation" and "base" metaphors, namely, the metaphor in which the grammar is viewed as a sentence factory: a device that constructs sentences by assembling deep structures, putting them on an assembly line in which various alterations are performed on them, and having well-formed surface structures come off the other end of the assembly line.[12] In terms of that metaphor, the idea that the base rules are complete corresponds to the idea that you have to have something to put on the assembly line at the start, and the idea that combinatorics should be a matter primarily or entirely of deep structure corresponds to the proposition that you should avoid having items come off the assembly line that fail a quality control test and have to be junked. I will argue in chapter 10 that languages in fact abound in combinatoric rules that relate directly to surface structure and have nothing to do with deep structure, a state of affairs that conflicts sharply with what the assembly line metaphor leads one to expect. The claim made a few pages back that valence relates to deep structure thus does not entitle one to claim that other kinds of combinatoric restrictions also relate to deep structure or that there are no combinatoric restrictions relating to other structural levels, such as surface structure.

c. Rule Interaction; the Cycle

A transformation specifies how two stages in a derivation may or must differ. Derivations typically consist of more than two stages, and something must be said about how the full set of transformations that a grammar contains may interact so as to specify in general what derivations that language allows.

The first question that arises is whether it really is necessary for derivations to have more than two stages, that is, for them to have intermediate stages in addition to the deep structure and the surface structure. Couldn't we get along with a system of transformations that "apply simultaneously," in the sense that they simply specify details of the correspondence between deep and surface structure, without reference to intermediate stages? There is in fact a class of situations that force recognition of intermediate stages in derivations, namely, situations in which one transformation **feeds** another: those in which the combination of elements that meet the conditions for being the input to the transformation is not present in deep structure but only in some derived structure. One transformation feeds another in a given derivation if an application of the first transformation "sets up the conditions for" the application of the second.

As an illustration of feeding, consider the derivation of (1b), as contrasted with (1a):

(1) a. Who signed the petition?
    b. By whom was the petition signed?

According to what was said in §2b about questions and passives, (1a) and (1b) have the same deep structure. There is an application of Inversion[13] in (1b) but not in (1a), as a consequence of the application of Passive in (1b) but not (1a): the passive transformation has the effect of converting *who,* the underlying subject, into the object of the preposition *by,* and it is because *by whom* is not the subject of the passive clause that Inversion is applicable to the passive clause (recall that Inversion applies when a non-subject interrogative expression precedes the subject). That is, in this derivation, Passive feeds Inversion. Moreover, the auxiliary verb that takes part in the inversion, namely, *was,* is not present in the deep structure but only in the stages of the derivation that are "after" (i.e., on the surface side of) the application of the passive transformation. Thus, the fact that Inversion applies in (1b) but not in (1a) is a consequence not of any difference in deep structure (since there is no difference) but rather of the difference be-

tween the structure to which Passive has not applied and that to which it has applied.

It is widely held by transformational grammarians (though no such assumption will be made here) that the transformations in any grammar have a fixed order of application. According to that conception of rule interaction (which is a natural concomitant of the "grammar as sentence factory" metaphor), each transformation gets its chance to apply in a derivation only after all preceding transformations have had their chance to apply. Passive might be rule number 7 in this list of transformations, Wh-movement rule number 13, and Inversion rule number 18, and the sequence of steps in the derivation of (1b) sketched in the last paragraph would simply reflect this fixed order of application of the transformations that happen to play a role in it.

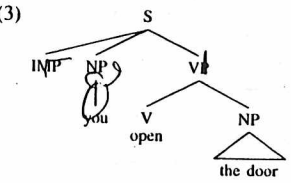
Note, however, that the necessity of allowing derivations such as the one just sketched provides no argument for the hypothesis that transformations have a fixed order of application, since any such derivation will be available as long as transformations can apply to the outputs of transformations, even if they apply irrespective of what other transformations have already applied. To argue for a fixed order of application of transformations (or for any other restriction on how transformations can interact), one needs to show that it **excludes** derivations that must be excluded. I will accordingly turn now to a well-known case in which transformations must be allowed to interact in one way rather than another and which has been widely used (incorrectly, I will maintain) as an argument for a fixed order of application of transformations. It is generally agreed that imperative sentences, as in (2), have deep structures with *you* as subject and that there is a transformation (let us call it **Imperative subject deletion,** or **ISD** for short) that deletes *you* when it is the subject of an imperative sentence:

(2) a. Open the door!
b. Defend yourself!
c. Tell me why you did that!

(See §21a for arguments in favor of such an analysis.) It is also generally agreed that there must be some difference in deep structure between imperative sentences and corresponding declarative (or interrogative, exclamative, etc.) sentences, and this distinction has generally been drawn simply by the ad hoc device of including in the deep structures of imperative sentences a symbol such as "IMP" that really amounts to a sign saying "I'm an imperative sentence." There are in fact a number of ways in which such a symbol could be incorporated into deep structures (a point that will

assume some significance below), but for the moment let us just give the most popular way of fitting it into a deep structure, as in (3), intended as the deep structure of (2a):

(3)

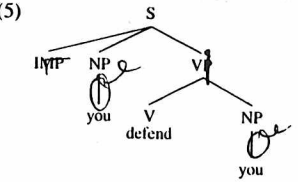


Let us see what the derivation of (2b) would be if this account of imperative sentences is combined with the popular analysis of reflexive pronouns (*myself, yourself,* etc.) in which they are taken to correspond to nonreflexive elements in deep structure and a transformation (call it **Reflexivization**) is posited that requires an underlying NP to be expressed as a reflexive pronoun if (roughly speaking) a preceding NP of the same clause has the same reference. Under the latter proposal, (4a) would have a deep structure looking like the surface structure of the ungrammatical (4b), and the reason that one would say (4a) rather than (4b) would be that the two occurrences of *you* in the same clause would have the same reference[14] and the second occurrence would accordingly have to be replaced by a reflexive pronoun:

(4) a. You defended yourself.
b. *You defended you.

The deep structure of (2b) would then be (5):

(5)

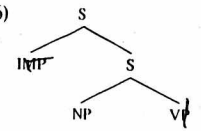


The conditions for Reflexivization and for ISD are both met in (5). However, if the first step of the derivation were an application of ISD, the structure derived would no longer meet the conditions for Reflexivization (we would have deleted one of the two coreferential NPs and there would thus no longer be the two coreferential NPs that provide the conditions for

Reflexivization), and the surface structure that we derived would then correspond to the ungrammatical (4b). We thus need to exclude somehow a derivation in which ISD applies to a structure like (5) without Reflexivization also applying.

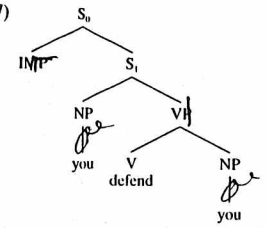
There are in fact ~~a large number of~~ ways in which such a derivation could be excluded (see Pullum 1976:44–46 ~~for details~~). The most popular way has been to invoke a fixed order of application for transformations: if Reflexivization is ordered before ISD, then ISD won't get a chance to delete the subject of the imperative sentence until Reflexivization has had its chance to turn into reflexive pronouns any other NPs that are coreferential with the subject. An alternative way of excluding the bad derivation emerges, though, if we consider one of the other ways in which the imperative marker might be fitted into deep structures. Specifically, suppose that it appears not inside the S in question (on a level with the NP and VP of that S) but outside ~~that S~~, as in (6):

(6)



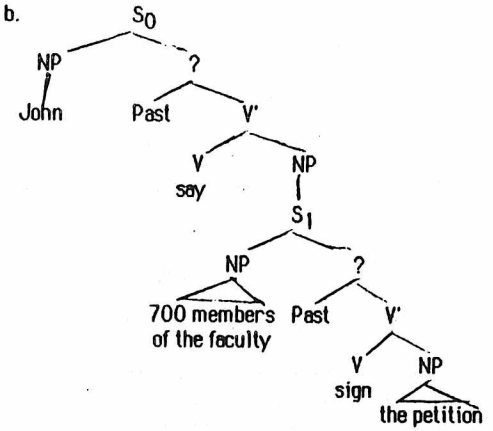
The difference between (6) and (3) appears at first to be completely trivial. It turns out, however, that (6) but not (3) allows the interaction between ISD and Reflexivization to be subsumed under a general principle about how rules interact. Consider the deep structure of (2b) under the hypothesis that structures like (6) and not (3) underlie imperatives:

(7)



Note that S_1 meets the conditions for Reflexivization, but it does not meet the conditions for ISD, at least if we take the statement that ISD applies only to imperative Ss as meaning that it applies only to a structure containing IMP. Only S_0 contains IMP and thus meets the conditions for ISD.

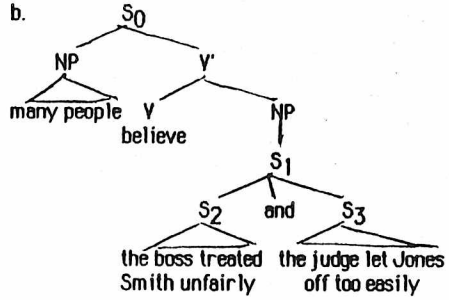
b.



The derivation of (8a) involves an application of Passive, but not an application of it to the entire structure (8b). Rather, Passive applies to the embedded sentence S_1 exactly the same way that it would if S_1 were the entire structure rather than a constituent of a larger structure. Passive, like many other transformations, applies to a S, but not necessarily to one that makes up the entire syntactic structure that it is at issue: the **domain** to which Passive applies in a derivation can in principle be **any** S, be it the whole or any part of the whole, just as long as that particular S meets the conditions for the application of the transformation. There can of course be derivations involving multiple applications of a single transformation with different domains of application. For example, (9a) has a derivation that involves three applications of Passive, with S_2, S_3, and S_0 (in the simplified deep structure given in (9b)) as their respective domains of application:

(9) a. It is believed by many persons that Smith was treated unfairly by the boss and Jones was let off too easily by the judge.

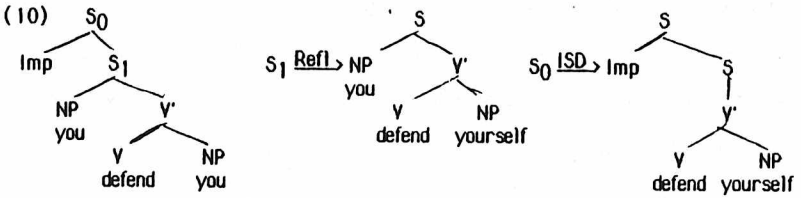
b.



We can then restate our conlusion about the derivation of (2b) by saying that if the underlying structure for imperatives is as in (6), Reflexivization and ISD apply to different

domains, whereas if it is as in (3) they apply to the same domain. The application of transformations to different domains is in fact governed by a principle (known as the principle of the **cycle**, or the **cyclic principle**) to the effect that when one domain to which transformations can apply is contained in another, the applications of transformations to the smaller domain precede the applications of transformations to the larger domain. This principle will correctly predict the interaction between Reflexivization and ISD without any need to resort to a fixed order of application of transformations: Reflexivization will apply to S_1 before ISD gets a chance to apply to S_0, simply because S_1 is contained in S_0. Accepting that principle, we obtain (10) as the derivation of (2b):

(10)



Note that in the step whose domain is S_1, the "superstructure" in which S_1 is embedded is not given; this mode of presentation, which will be adhered to below, emphasizes that, for the purposes of that step, all material outside of S_1 is irrelevant.

The principle of the cycle will in fact ~~turn out to~~ be our most powerful tool for predicting the way in which transformations interact with one another. Note, though, that minor differences between analyses can often affect whether the principle of the cycle will have any implications about the interaction of the transformations that are at issue, for example, the fairly minor change from (3) to (6) as the underlying structure of imperatives was sufficient to bring the interaction of Reflexivization and ISD under the purview of the cyclic principle. This is the case because fairly minor differences between analyses can affect how many different domains there are to which transformations might apply, and the more domains there are, the more the cyclic principle implies about the interactions of transformations. Accordingly, I will adopt a policy of examining the fine details of proposed analyses whenever there appears to be some restriction on the order in which transformations can apply and will seek analyses in which no stipulation of a fixed order of application of transformations need be made, that is, analyses in which the cyclic principle (and perhaps other principles governing how the steps in a derivation may interact) suffices to determine how applications of transformations may combine in derivations.

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While the cyclic principle will be taken henceforth as defining the "normal" way for transformations to apply, there are in fact some transformations that do not apply in the "normal" way. To see this, let us attempt to justify our earlier statement that there are two separate transformations that combine a tense with an auxiliary verb, one (henceforth, **Attraction-to-Tense**) applying to auxiliary verbs and one (henceforth, **Tense-hopping**) applying to main verbs: it will turn out that one of several differences between these two transformations is that Attraction-to-tense applies in the "normal" way while Tense-hopping does not. This difference emerges from a consideration of **V^t-deletion**, which optionally deletes a constituent of the sort that we have been calling a V^r here (a verb plus its "objects", if any) when an identical V^t occurs elsewhere in the structure:

(11) a. John has given $100 to the March of Dimes, and Mary has given $100 to the March of Dimes too.

a'. John has given $100 to the March of Dimes, and Mary has Ø too.

b. Since Amy is applying to Stanford, I'll bet Bert is applying to Stanford too.

b'. Since Amy is applying to Stanford, I'll bet Bert is Ø too.

c. Roger thinks the Red Sox will win the pennant, and Lucy thinks the Tigers will win the pennant.

c'. Roger thinks the Red Sox will win the pennant, and Lucy thinks the Tigers will Ø.

I maintain that sentences such as (12a, b) involve V^t-deletion applying to a structure such as underlies a sentence with no auxiliary verb (12a', b'), and that the tense which appears on *do* in (12a, b) is the tense that would have appeared on the main verb if the V^r had not been deleted:

(12) a. The audience listened to the speaker, and the ushers did Ø too.

a'. The audience listened to the speaker, and the ushers listened to him too.

b. If Tom owns a Mercedes, Susan does Ø too.

b'. If Tom owns a Mercedes, Susan owns one too.

If V^t-deletion is indeed the deletion of one of two identical V^ts, then V^t-deletion in (12a) will have to apply to a structure in which the past tense is outside of *listen to the speaker* in both clauses, and in (12b) it will have to apply to a structure in which the present tense is outside

play bridge in both clauses.

At first, it might seem that the result of applying VP-deletion to the structure underlying (12a') would be (13):

(13) The audience listened to the speaker, and the ushers too.

However, it is easy to see that the deletion in (13) (which is known as **Stripping**) is a different phenomenon from what we observed in (11). First, it is not allowed when one of the two V^rs is in a clause subordinate to the clause containing the other V^r (14a-a'), though the V^r-deletion noted in (11) is allowed in such structures:

(14) a. * If Tom owns a Mercedes, Susan too.

a'. *Tom owns a Mercedes, and I'm pretty sure that Susan too.

b. If Tom has bought a Mercedes, Susan has too.

b'. Tom has bought a Mercedes, and I'm pretty sure that Susan has too.

Rather, Stripping is restricted to cases in which those two clauses are conjoined with each other. Second and more importantly, Stripping does not necessarily delete a V^r but rather reduces the second conjunct down to one constituent that contrasts with its counterpart in the first conjunct of the conjoined sentence:

(15) a. John put garlic in the meatloaf, and anise too. (< John put anise in the meatloaf too.)

b. Mary sends letters to India by airmail, and parcels too. (< Mary sends parcels to India by airmail too.)

It is only when the contrasting constituent is the subject that the material deleted by Stripping happens to make up a V^r, or even to be a syntactic constituent.

Unlike Stripping, in which the clause undergoing the deletion and the "antecedent" clause have to be conjoined with each other, V^r-deletion is subject to virtually no restriction on where the two clauses appear in relation to each other, and they can indeed be very far from one another in the syntactic structure:

(16) Any person who is stupid enough to tell me that he thinks Tom is buying a Mercedes could probably be made to believe that Susan is Ø too.

In this respect, the deletion noted in (12), in which the tense appears on *do*, is exactly parallel to

the deletions in (11), where a tensed auxiliary verb remained behind:

(17) Any person who is stupid enough to tell me that he thinks Tom bought a Mercedes could probably be made to believe that Susan did Ø too.

We can thus say with reasonable confidence that the deletion in (12) instantiates the same phenomenon noted in (11), in which one of two identical V^rs is deleted.

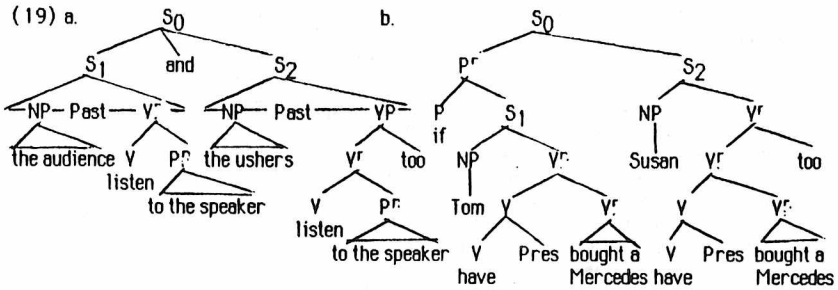
Some important consequences emerge from this conclusion. First, it implies that in a sentence such as (12a), V^r deletion applies to a structure containing two occurrences of a tenseless V^r (here, *listen to the speaker*), since it has to delete such a V^r and leave the tense behind. Second, it implies that in deep structure, tenses are not merely separate from the verbs that they are attached to in surface structure but are indeed not even within the V^rs that those verbs are the heads of.[1] However, V^r-deletion **cannot** leave behind a tense that in the full version of the sentence would be attached to an auxiliary verb, e.g. *have bought a Mercedes* cannot be deleted in an alternative version of (14a), nor can *be caught by the police* in an alternative version of *Smith was caught by the police and his accomplice was too*:

(18) a. *If Tom has bought a Mercedes, Susan does too.

b. *Smith was caught by the police, and his accomplice did too.

The input to VP-deletion in the two cases must thus be as in the following two structures (the former given in a form that leaves open the question of where exactly the tense is in deep structure, as long as it is outside the V^r):[19]

(19) a.



b.

In both cases, S_0 is the smallest constituent containing two identical V^rs and thus the only potential domain for the application of V^r-deletion. In (19a), Past cannot yet have been combined with the verb *listen*, since if V^r-deletion is to yield (12a), it has to apply to apply to a structure

containing two occurrences of (tenseless) *listen to the speaker* for it to delete one of. However, in (19b), Past has to have already been combined with the *have*, so that V' -deletion will not be able to delete (tenseless) *have bought a Mercedes* and thus derive the unacceptable (18a). These are precisely the derivations that will be available if Attraction- to-Tense applies in accordance with the cyclic principle but Tense-hopping is postcyclic, i.e. if its application is postponed until after the application of any relevant "cyclic" transformations (here, V' -deletion).

Let us now turn to some facts which point to a further difference between Tense-hopping and Attraction, namely that Tense-hopping moves a tense "down" to where the main verb is, while Attraction-to-tense moves an auxiliary verb "up" to where the tense is. Note the positions that the adverb *often* can occupy in the following sentences:

(20) a. Susan often is the student with the best grades.

a'. Susan is often the student with the best grades.

b. Susan often has been the student with the best grades.

b'. Susan has often been the student with the best grades.

b". ??Susan has been often the student with the best grades.

In (20a-a'), *often* can appear either before the verb *be* or between *be* and the predicate NP. In (20b-b"), *often* can appear either before or after the auxiliary verb *have*, but it sounds quite odd when it intervenes between *be* and the same predicate NP that it was allowed to precede in (20a'). The difference between (20a') and (20b") that can most plausibly be held responsible for the difference in acceptability of a *be often NP* sequence is that *be* bears the tense in (20a') but not in (20b"), where it is *have* that bears the (present) tense. More specifically, suppose that *often* can modify a V' but cannot modify a predicate NP (thus, that *often be the student with the best grades* normally can occur within a larger sentence but *be often the student with the best grades* normally cannot) but that the step that combines an auxiliary verb[20] with a tense attracts the auxiliary verb to the tense, thus moving it out of its V', leaving behind any adverbs that modified that VP. If one applied this suggestion to a deep structure in which the present tense is outside of the (tenseless) V' *often [be the student with the best grades]*, the word order in (20a') would then result. There would not be any derivation for the word order in (20b"), however, since,

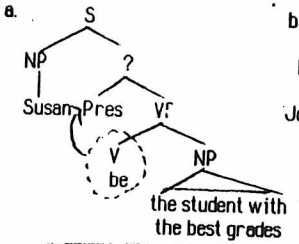
under this proposal, the only way that *be* could come to be before *often* would be by being combined with the tense, and in (20b") it is not *be* but rather *have* that is combined with the tense. The combining of a tense with a main verb, however, would have to correspond to a different transformation in which the tense is moved to where the verb is, since a main verb cannot be followed by a V'-modifying adverb the way that *be* is in (20a'):

(21) a. John often beats his wife.

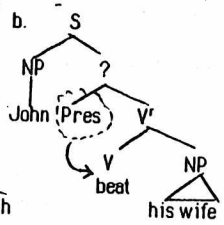
a'. *John beats often his wife.

In chapter 3, we will give reasons why in the surface structure of a sentence like (20b), *is often NP* is a constituent, indeed a V'. We thus need to assume that Attraction-to-tense applies to a structure as in (22a) in which the tense and the V' make up a constituent, since only then will moving the auxiliary V to where the tense is yields an output in which the items in those positions make up a constituent. Thus, Attraction-to-tense and Tense-hopping work as in (22):

(22) a.

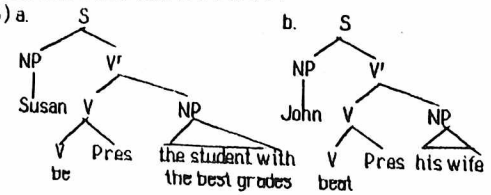


b.



It is not at all obvious what category label should be applied to a constituent consisting of a tense and a V' (thus the "?" in (22)), but if we follow the terminological scheme sketched in S2a and identify the [Pres V'] constituent as a phrasal unit and Pres as its head, we can at least consistently give it a category label consisting of a symbol for the part of speech to which Pres belongs plus a '. Since tenses belong to no part of speech (i.e. they are not nouns, nor verbs, nor adjectives, ...), we can thus appropriately replace the ? of (22) by the symbol 0' (read "zero bar"), meaning a phrasal unit whose head belongs to no part of speech.[21] The categories of the constituents in the output are clear, since the combination of a V and a tense is itself a V, and a phrasal unit whose head is a V is a V'.[22]

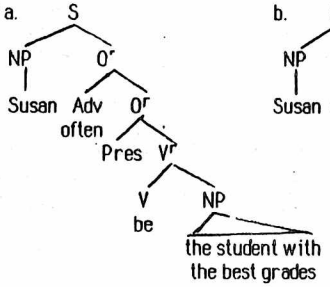
(23) a.



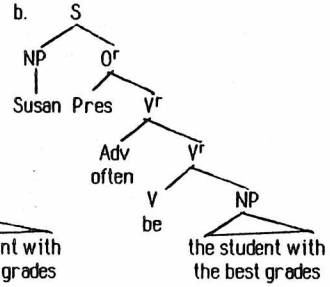
b.

For the moment, then (until tenses are reconsidered in chapter 8), let us treat tenses as fitting into deep structures in the position in which they appear in (22). We can then describe the differences between the word orders in (20a-a') and (20b-b') as reflecting a difference in whether the tense is part of what the adverb modifies. Specifically, suppose that we take *often* as modifying either a V^r or a 0^t. Then (20a-a') will have the deep structures (24a-a') respectively, and the different word orders will correspond to whether the position that *be* is moved into is above or below the Adv:

(24) a.

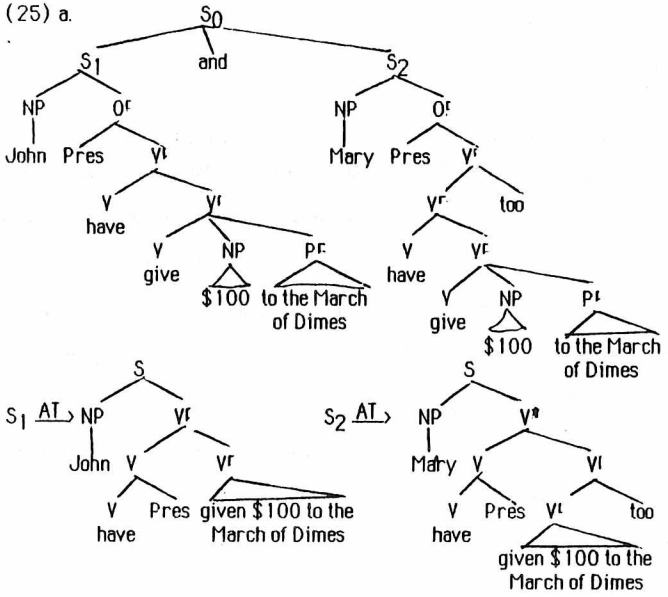


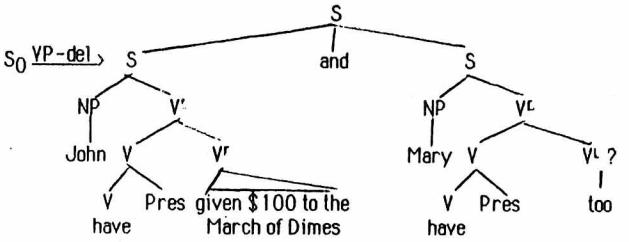
b.



We are now in a position to give derivations of some of the earlier examples, e.g. (11a'):

(25) a.





In chapter 6, after we have examined a fairly broad range of transformations and derivations and will thus have more of the perspective that one needs in order to be in a position to draw even tentative generalizations about what can make up a derivation and to evaluate those generalizations, we will examine in considerable detail the questions that we have raised in this section. For the present, let me just summarize briefly the position that will eventually be arrived at below. (i) The cyclic principle will do most of the work of predicting how transformations can interact, subject to the qualifications that (ii) a limited set of transformations (so-called **postcyclic** transformations) will have to be exempted from the principle, and (iii) not

of which we have already encountered two: Tense-hopping and
-support

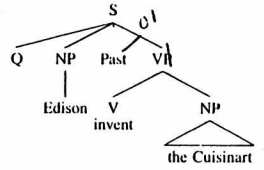
only Ss but also constituents of other categories will be admitted as domains to which transformations can apply. In addition, (iv) over and above the types of syntactic rules discussed so far, it will be necessary also to recognize restrictions on the surface shapes that sentences in the given language can take (see chap. 10); these restrictions will indirectly restrict the possibilities for combining transformations in a derivation, since the application or nonapplication of an "optional" transformation will sometimes make the difference between conformity to and violation of a restriction on surface structure, that is, restrictions on surface structures make particular instances of an optional transformation in effect obligatory or in effect inapplicable.

d. Deep Structure and Semantic Structure

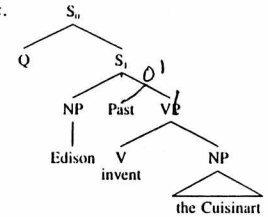
Besides allowing the cyclic principle to correctly predict the way that ISD interacts with Reflexivization (indeed, the way that it interacts with all transformations that would apply to a domain in the position of S_1 in (7)), the analysis in which the imperative marker is placed as in (7) has an additional advantage over that in which it is placed as in (3), namely, that (7) is a closer approximation than (3) is to the semantic structure of an imperative like *Open the door!:* the meaning of *Open the door!* is not just a combination of three elements of meaning corresponding to "IMP," *you*, and the VP *open the door* but is rather the meaning of a sentence like *You open the door* or *You will open the door* combined with a notion of imperativeness. This point is even clearer with the parallel analysis of interrogative sentences that will be developed in chapters 8 and 14, in which there is an element of deep structure (Q) indicating that the sentence is interrogative. We will need to inquire whether that element combines into deep structures as in (1b) or as in (1c) (as the deep structure of (1a)):

(1) a. Did Edison invent the Cuisinart?

b.



c.



The structure in (1c) not only allows one to predict the interaction of Inversion (which applies to the domain S_0 because it is sensitive to Q) and such

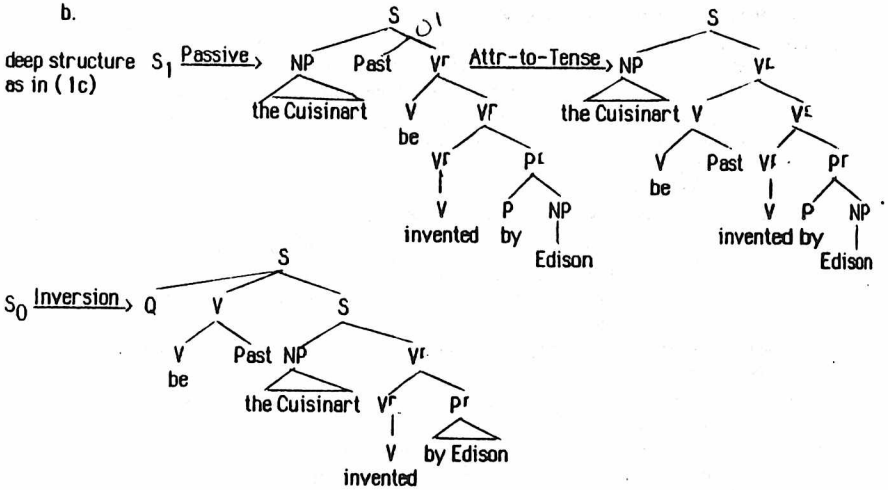
2.29a

transformations as Passive whose conditions for application are met in S_1; for example, the cyclic principle will allow only a derivation in which Passive and Attr-to-tense apply with S_1 as domain before Inversion applies with S_0 as domain, thus providing a derivation for (2a) while excluding a derivation for (2a'), which could be derived only by allowing Inversion to apply before the tense is combined with *be*:

(2) a. Was the Cuisinart invented by Edison?

a'. *Did the Cuisinart be invented by Edison?

b.



In addition, (1b) corresponds more directly to the semantic structure of (1a) than does (1c): (1a) asks whether it is true that.

2.29b

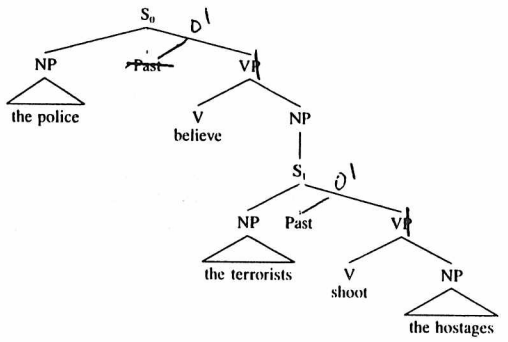
transformations as Passive whose conditions for application are met in S_1, which the structure in (1b) does not allow, but it also corresponds more directly to the semantic structure of (1a): (1a) asks whether it is true that Edison invented the Cuisinart, and (1c) but not (1b) contains a constituent (S_1) corresponding to the proposition that (1a) asks about.

The notion of "meaning" is sufficiently controversial and elusive that it would be rash, especially at this early a point in this book, to take a very specific stand on the relationship of meaning to syntactic structure. There are, for one thing, a number of distinct notions of meaning. For example, there are notions of "literal meaning" and of various kinds of conveyed meaning: *No man is an island* has a literal meaning in which it expresses the same sort of trivial truth as does *No coffee cup is an eyebrow*, but it also allows a metaphoric interpretation in which it expresses, roughly, the proposition that every person's fate affects the rest of humanity. And when it is uttered in certain contexts, the metaphoric interpretation can serve to convey, say, that the person to whom it is addressed should seek help. For the moment, I will simply adopt a policy of paying attention to relations between syntax and any of the kinds of meaning that can be distinguished and of attempting to identify respects in which details of particular kinds of meaning correlate more directly with one "level" of syntactic structure than with another, or with one particular syntactic analysis rather than with its competitors.

One respect in which the deep structures of the analyses developed below will correlate fairly closely with at least one notion of meaning is that they involve constituents that play a semantic role in the sentence but do not necessarily correspond to any constituent of surface structure. For example, according to the analyses that will be developed in chapters 4 and 5, (2a) will have a deep structure that is roughly as in (2b):

(2) a. The hostages are believed by the police to have been shot by the terrorists.

b.



Note that the meaning of (2a) involves the proposition that the terrorists shot the hostages (it says that the police believe that proposition), the deep structure (2b) contains a constituent (S_1) that corresponds to that proposition, while no constituent of the surface structure can be held to contribute precisely that proposition (no more and no less) to the meaning of the whole sentence.

In the course of this book, I will bring into the discussion of the various syntactic analyses comments on the extent to which they allow for a close match between syntactic structure, especially deep syntactic structure, and semantic structure. It will develop that a very close match can be achieved. As evidence for or against putative syntactic analyses, I regard facts about interactions between syntax and semantics (indeed, interactions between syntax and anything) as on a par with "purely syntactic" facts (which is not to suggest that I think many facts are purely syntactic). Consequently, a conflict between the putative syntactic analysis of a sentence and the meaning of that sentence will count as evidence against the analysis. For example, the fact that (2a) has to do with the terrorists shooting the hostages and not with the hostages shooting the terrorists would provide an argument against an analysis in which (2a) was assigned a deep structure containing a S that corresponded to the proposition that the hostages shot the terrorists.

It remains to be seen, of course, whether there are cases in which syntactic considerations favored an analysis that semantic considerations would lead us to reject. If such cases exist, they discredit the suggested close match between deep structure and semantics. I leave it to the readers of this book to decide for themselves whether the semantic arguments that turn up with considerable frequency in the following chapters lead to any misrepresentation of syntactic facts or whether, as I would maintain, they help a syntactician to discover and account for syntactic facts that might otherwise escape detection.

e. Syntax in Relation to Linguistic Typology

This book is concerned both with **the syntax of** English and with **syntax,** the branch of linguistics whose subject matter is the syntaxes of languages and which is thus concerned with such general questions as those of what can go into the syntax of a language and of how the syntaxes of languages may differ from one another. Thus, in the course of working out the details of a large part of the syntax of English, we will often have occasion to raise questions about syntax in general and to propose and test general propositions of syntax that are relevant to the phenomena of English that are described. We will, for example, raise questions relating to the units in terms

of which syntactic phenomena operate (e.g., is the structure of sentences appropriately described in terms of "grammatical relations" like "subject" and "modifier," as in my informal description of Passive in §2b, or do different notions provide a more satisfactory basis for describing syntactic phenomena?), or relating to the way in which syntactic phenomena interact with one another (for example, is the fact that the verb *be* in *The hostage was shot by the terrorists* agrees in number with *the hostage* and not with *the terrorists* merely a quirk of English, or is it a consequence of some general principle about how phenomena like agreement and passive structure may interact?).

The answers to such questions have implications about how languages may differ from one another. For example, the last question amounts to the question of whether it is possible for a language to be just like English except that the tense-bearing verb of the passive agrees with the underlying subject of the clause rather than with the surface subject. To answer questions about English, it will thus often be necessary to examine facts about other languages. That is, phenomena of English will generally be given analyses in which they are treated as reflecting a division of labor between language-particular rules and universal principles about language, and to fully justify an analysis, one needs not only to show that the analysis describes English accurately but also to verify both that the universal principles are universal and that all of the details of the putative rule of English are actually specific to English and not consequences of other facts of English plus universal principles.

In English *not* must precede its **focus** (the item, if any, that it contrasts with other things):

(1) a. Not Bob but Alice won the prize.
a′. *Bob not but Alice won the prize.
b. Alice, not Bob, won the prize.
b′. *Alice, Bob not, won the prize.

That this detail of English word order is not universal can easily be demonstrated by pointing to languages in which a negative element must follow its focus, such as Turkish:

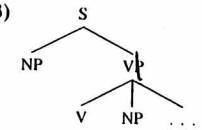
(2) a. Ahmet değil Orhan gitti.
(name) not (name) went
'Not Ahmet but Orhan went'
a′. *Değil Ahmet Orhan gitti.

Thus, a linguist constructing an account of English sentences like those in (1) can be assured that the rules specific to English in his account must

specify in some fashion or other that *not* precedes its focus. This, of course, still leaves considerable latitude regarding the exact nature of the rule(s), in particular, regarding how general they are: what we have said so far leaves it open whether the restriction on word order noted in (1) is a property just of *not* or of some more general class of words or of syntactic constructions.

Until we have explored a fair amount of syntax, it will be hard to give examples of universals that make details of language-particular phenomena predictable, since most of the universals cannot be stated without involving ideas that cannot be introduced until later in this book. But let us take a look at one such example anyway, even though in doing so we will get considerably ahead of ourselves. In §2b I have already introduced the popular analysis in which English passive clauses are described in terms of a syntactic transformation that applies to the same structure that underlies the corresponding active S. The structure to which this transformation applies must involve a NP and a VP with the latter consisting of a verb and a NP and possibly additional material:

(3)

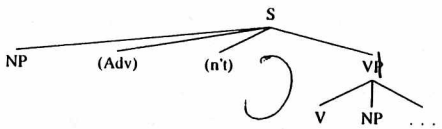


This statement of what the passive transformation may apply to makes no mention of certain other things that often occur in passive clauses, for example, the negative marker *n't* and adverbs such as *probably:*

(4) The hostage probably wasn't shot by the terrorists.

Linguists have in fact often given formulations of Passive that explicitly mention the optional presence of such elements in the structures to which it applies, thus formulating its conditions of application not in terms of the pristine structure (3) but rather in terms of something like (5):

(5)

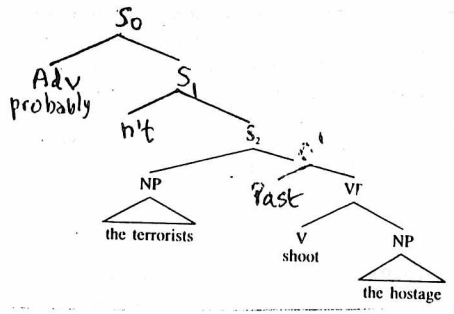


The latter formulations of Passive make it sound as if the presence of *n't* or of adverbs was potentially relevant to the application of Passive, in the sense that if the particular passive transformation of a given language did

not explicitly provide for the presence of such elements, their presence would render Passive inapplicable.

I maintain, however, that a language in which such elements block the application of Passive is not possible.[16] Indeed, when the pristine form (3) of the conditions for application of Passive is combined with the rules for negation and for adverbs, certain universal principles will imply that passive sentences like (4) must be possible in English. The universals in question are: (i) that negative Ss have a deep structure of the form "negative element plus S,"[17] (ii) that a sentence-modifying adverb (as opposed to adverbs that modify Vs or VPs, which will be discussed in chap. 19) likewise combines in deep structure with a S to form a larger S, and (iii) that (with some qualifications that do not apply here) transformations obey the cyclic principle. According to (i)–(ii), there are deep structures such as (6):

(6)

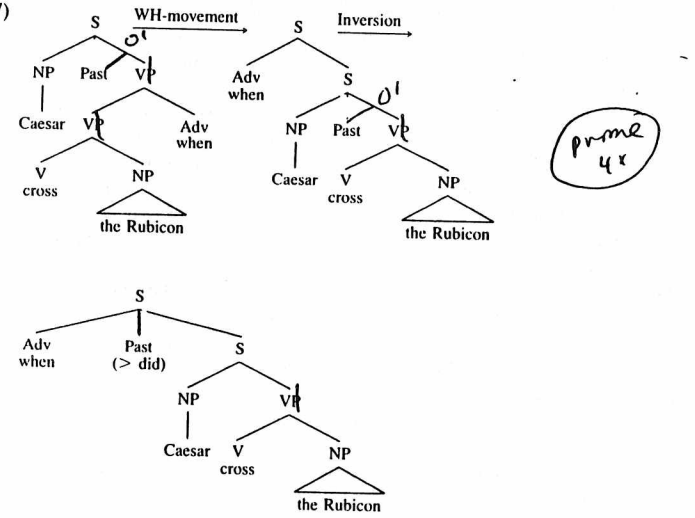


According to (iii), Passive gets a chance to apply to S_2 in (6) irrespective of the presence of *n't* and *probably* outside of S_2, and the normal rules for placement of *n't* and of adverbs apply to the passive clause derived from S_2 just as in the case of an active clause, which will then provide a derivation for (4).

Another interaction between universal principles and the syntactic rules of a particular language can be illustrated by considering English WH-questions, i.e., questions such as *Who is buried in Grant's tomb?* or *When did Caesar cross the Rubicon?* These questions ask the hearer to "fill in the blanks" (here, to fill in the blanks in "_____ is buried in Grant's tomb" and "Caesar crossed the Rubicon on _____"). The interrogative expression (such as *who, where,* or *for what reason*) with which a WH-question begins indicates the kind of information with which the blank is to be filled. As was pointed out in §2b, the interrogative expression must be followed by something having the shape of a corresponding declarative sentence except that it lacks any expression corresponding to the

"blank" and begins with an auxiliary verb. One can thus describe English WH-questions by (i) positing a deep structure that is just like that of a declarative S except that it has an interrogative expression in place of one of the constituents,[18] and (ii) positing transformations that move the interrogative expressions to the beginning (WH-movement) and move a tense or an auxiliary verb to the position immediately after the interrogative expression (Inversion):

(7)



Note, however, that not all combinations of an underlying structure and derivation that conform to this informal sketch yield normal English WH-questions. For example, the questions by which one ought to be able to request that someone fill in the blanks in (8a, 8b) are not normal English:

(8) a. Jascha Heifetz and _____ played the Kreutzer Sonata.
a'. *Who did Jascha Heifetz and play the Kreutzer Sonata?
b. Your mother attributed your low grades to _____ and laziness.
b'. *What did your mother attribute your low grades to and laziness?
b". ??To what and laziness did your mother attribute your low grades?

c. Your mother attributed your low grades to laziness and a distaste for ___

c'. *What did your mother attribute your low grades to laziness and a distaste for?

c". *To laziness and a distaste for what did your mother attribute your low grades?

:re is a characteristic shared by (8a) and (8b) that could reasonably held responsible for the abnormality of the corresponding questions,

namely, that in both cases the blank is part of a conjoined expression. Ross (1967a) has argued that not only is this the source of the abnormality of questions like (8a′, b′), but indeed a universal principle excludes the derivational steps that would otherwise relate deep structures like (8a, b) to such questions. Specifically, he argues that there is a universal constraint excluding derivational steps in which material is moved out of a conjoined expression. The oddity of (8a′, b′) can then be regarded as reflecting the interaction of that universal principle with a syntactic rule (WH-movement) that is specific to English. To form WH-questions corresponding to (8a, b), one is required by that rule of English to perform an operation that a universal principle of syntax rules out. The result is a class of questions that make perfect sense but cannot be asked in English because of a conflict between a requirement of English syntax and a universal syntactic principle.[iv]

As an example of an issue that can be illuminated by considerations of language universals, consider the (highly controversial) question of what the syntactic status of auxiliary verbs is. According to one fairly popular view, English auxiliary verbs stand in the same relation to main verbs as "determiners" (such as *the, a, every*) do to the nouns with which they are combined. According to another fairly popular view, auxiliary verbs are verbs that combine with dependent verb phrases the same way that many main verbs do. In the former view, in (9a) the relationship of *is* to *drinking beer* is the same as that of *the* to *governor of Utah* in (9b), while in the latter view it is the same as that of *try* to *drinking beer* in (9c):

(9) a. (Fred) is drinking beer.
b. the governor of Utah
c. (Fred) tried drinking beer.

Since English auxiliary verbs are few in number and their syntax is somewhat idiosyntactic, it is not surprising that different linguists see different (incomplete) parallelisms between their behavior and that of other kinds of words. To determine whether either of the alleged parallelisms is significant or just represents flukes of English, it is useful to see whether there are universal correlations in the behavior of auxiliary verbs and the classes of words to which they are held to be parallel. For example, one of the parallels to which adherents of the first position attach importance is that of word order: auxiliaries precede main verbs and determiners precede head nouns. That position would receive strong support if it could be shown that such a correlation is universal: that in all languages auxiliary verbs have the same linear order relation to main verbs as determiners do to head nouns. It turns out, however, that there is no such correlation: the

world abounds both in languages where determiners precede nouns but auxiliaries follow main verbs and in languages where determiners follow nouns and auxiliaries precede main verbs:

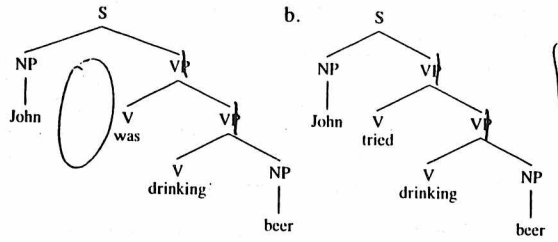
		Auxiliary: before main V	Auxiliary: after main V
Determiner	before N	English, Russian	Japanese, Turkish
	after N	Malay, Swahili	Basque, Somali

Thus, the fact that auxiliary verbs precede main verbs in English, viewed from a cross-linguistic perspective, appears to have no more connection with the fact that determiners precede nouns than it has with any other fact about English word order. By contrast, whether auxiliary verbs precede or follow main verbs in a language correlates strongly with whether main verbs in that language precede or follow their nonfinite dependent VPs. For example, in Swahili, just as in English, auxiliary verbs precede main verbs and main verbs precede their nonfinite complements:

(10) a. Alikuwa anasoma.
he-was he-reading
'He was reading'.
b. Amekwisha kwenda.
he-finishes go
'He has already gone'.
c. Watoto hawawezi [kupigwa jambo kama hili].
children not-could be-punished matter like this
'Children could not be punished for such a matter'.
d. Hajapata kwenda kusafiri bado.
he-not-gets go to-trip yet
'He has not yet managed to travel'. (Examples from Ashton 1947: 249, 271, 276)

Nearly all languages possessing one of these two characteristics also possess the other, irrespective of whether determiners in that language precede nouns (as in English) or follow them (as in Swahili). Thus, considerations of linguistic typology support the analysis of English auxiliary verbs that will be argued for in chapter 8, in which they fit into surface structures the same way main verbs that take nonfinite VPs as complements do:

(11) a.



b.

To the extent that an analysis of one language is given in terms that can be interpreted in other languages, the analysis has implications about what should be possible in other languages: it identifies factors responsible for the given phenomenon and implies that the same factors should favor corresponding phenomena in other languages.

f. Some Caveats and Addenda to the Preceding Sections

CONCERNING §2A "Ordered labeled tree" is a species of what are called **graphs** in the branch of mathematics known as graph theory. In McCawley 1982, I give a set of axioms that distinguish ordered labeled trees from other "graphs." The axioms can be paraphrased as follows:[20]

(1) A tree consists of a set of objects (the **nodes**), two relations ("directly dominates" and "is to the left of") between the nodes,[21] and a function associating each node with a **label,** such that:

i. There is a node (the **root** of the tree) that dominates every other node of the tree.[22] This axiom excludes a structure such as (2a).

ii. The root is not dominated by any other node of the tree. This axiom excludes structures as in (2b).[23]

iii. The tree has no "loops," i.e., a node can be directly dominated by at most one other node, whence there can be at most one path leading from a higher node to a lower node. This axiom excludes structures as in (2c).[24]

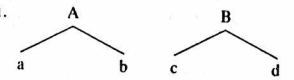
iv. "Is to the left of" is a **partial ordering,** i.e., it is antisymmetric (if x is to the left of y, then y is not to the left of x) and transitive (if x is to the left of y and y is to the left of z, then x is to the left of z).

v. If two nodes are **terminal,** i.e., do not dominate any other nodes, then one of them must be to the left of the other. That is, with respect to the terminal nodes, "is to the left of" is a **total ordering.**

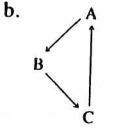
vi. If one node dominates another, then it is neither to the left nor to the right of it.

vii. A nonterminal node is to the left of another nonterminal node if and only if every terminal node that it dominates is to the left of every terminal node that the other dominates. This axiom excludes structures as in (2d).

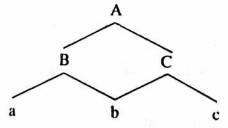
(2) a.



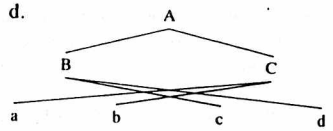
b.



c.

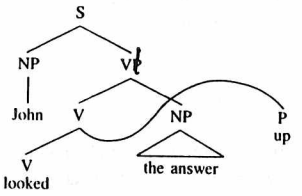


d.



Axioms v–vii might be given in a simpler form if it were not that I want to allow for the possibility of **discontinuous constituent structure,** i.e., for trees in which a node dominates two items without dominating everything that is between them, as in (3):

(3)



Structures such as (3) were widely accepted by descriptivist linguists in the 1940s and 1950s but have been almost uniformly rejected by transformational grammarians. Since I regard as preposterous the grounds on which transformational grammarians have rejected that type of structure (see McCawley 1982 for details), I harbor no prejudice against it. There are indeed several syntactic constructions for which there are strong arguments in favor of an analysis in terms of discontinuous structure, including parenthetical constructions (4a), nonrestrictive relative clause constructions (4b), and extraposed relative clause constructions (4c):

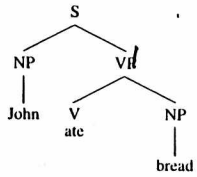
(4) a. Your brother, I'm fairly sure, won't want to help you.

b. Your brother, whom I don't trust, isn't a good person to ask.
c. Several persons have filed suits who were injured in the accident.

When those constructions are taken up below, I will present the arguments for a discontinuous structure.

While I regard the outright rejection of discontinuous structure as misguided, I note that continuous structures allow one to indulge in a typographical convenience, namely, that of representing the tree by a labeled bracketing, e.g., the information embodied in the diagram (5a) can be represented by the formula (5b):

(5) a.



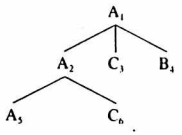
b. [$_S$ [$_{NP}$ John] [$_{VP}$ ~~[$_V$ ate]~~ [$_{NP}$ bread]]]

For convenience, I will in fact often use formulas like (5b) when referring to continuous structures; e.g., I will use [$_{VP}$ V AP] as a shorthand device to refer to a verb phrase consisting of verb followed by adjective phrase.

I should also point out that the terms "tree" and "tree diagram" are by no means interchangeable, though their uncritical use often makes them seem ~~interchangeable~~. The typographical objects that appear as (3) and (5a) are tree diagrams, and the abstract objects that they represent are trees. A tree diagram consists of symbols and lines, a tree consists of units and relationships among those units. It makes sense to say that a sentence is a tree, i.e., that it consists of units and relationships that satisfy the axioms (1), but it would make no sense to say that a sentence is a tree diagram. It is worth the while of an advocate of the former proposition to choose his words carefully so as to avoid giving the false impression that he is advocating the (absurd) other proposition.

We will have frequent occasion below to speak of the location of one node in a tree in relation to another. The terminology that has evolved for this purpose is an extension of kinship terminology, in which the various nodes are spoken of as female and the links between them as parent-child relations. This terminology can be illustrated in terms of the following tree:[25]

(6)



We speak of 1 as the mother of 2, 3, and 4; of 2, 3, and 4 as daughters of 1; of 2, 3, and 4 as sisters of one another; and occasionally of 3 as an aunt of 6, of 6 as a niece of 3, etc., though only "mother," "daughter," and "sister" are in common use as names of relations between nodes in trees. Often the kinship terms are combined with "left" and "right," as when we speak of 5 as a left sister of 6, or of 3 and 4 as right sisters of 2.

CONCERNING §2B Throughout §2b, I have spoken as if underlying syntactic structures consisted of exactly the same sorts of units and relations as make up surface structures. There are some respects in which it may be worthwhile to relax such a requirement. First, it is far from clear that the nodes of underlying trees must be assumed to have a full left-to-right order. While transformational grammarians have generally assumed that all syntactic structures are fully ordered and many influential analyses have been presented in such a way as to imply that the crux of the analysis is a difference in word order between deep and surface structures, there usually are equally acceptable alternative analyses in which the relevant difference between underlying and surface structure is one of constituent structure, with underlying word order being immaterial. The reader of this book should be prepared to see the relative importance of underlying constituent structure increase and that of underlying word order decrease as he advances through the book. I do not find it at all clear that **any** underlying word order need be posited for any language.

Second, while words in surface structure must have determinate morphological forms (e.g., if a noun has distinct singular and plural forms, it must be one or the other in surface structure), it will be argued in §11e that underlying structures must often be taken to be indeterminate with regard to inflectional categories, e.g., nouns in underlying structures must in many cases be left unspecified with regard to the singular/plural distinction. In such cases I will endeavor to make clear whether a unit written, e.g., *dog* is to be taken as singular or as neutral with regard to number.

The discussion of derivations here has sidestepped the important question of whether deep, intermediate, and surface structures should be regarded, as they are here, as separate entities, or instead as merely different parts of a single complex syntactic structure, as in such approaches as those of Jespersen 1937 and Perlmutter 1983, where deep and surface grammatical relations are represented together in the same complex structure.

CONCERNING §2C While the discussion of rule interaction in this section has been entirely in terms of a rule's interaction with **other** rules, everything that was said applies equally to interactions between different applications of the same rule. If a single transformation is in principle applicable to

several domains within a single complex syntactic structure, one must raise the question of whether its application to one domain presupposes its application to another domain, whether its application to the one might destroy the conditions for its application to the other, and so forth.

EXERCISES

1. a. In the last tree in §2b(24), indicate the mother, the sisters, and the daughters of the lower S node.
   b. Represent that tree in the alternative notation that uses labeled brackets.
2. For each of the following verbs, give a selection of examples illustrating what kinds of constituents it can be combined with in active Ss, and give the relevant examples to check whether its distribution in passive Ss conforms with the informal statement of §2b (i.e., that in the passive it combines with what it combines with in the active, minus one NP):
   a. ~~give~~ d. ascribe
   b. report e. deprive
   c. accuse f. elect

   When the active VP contains two NPs, does it matter which one is missing from the passive VP?
3. Using the ~~model of §2b(14)~~, give in full the presumable derivations of the following sentences:
   a. By whom was the petition signed? (= §2c(1b); give a derivation that conforms to what was said there about that example)
   b. Which students did the Bargle Foundation offer scholarships to?
   c. Which students did the dean say that the Bargle Foundation offered scholarships to?
   d. To which corporations did Smith offer himself as a consultant?
   e. Put yourself in my place.

   Make the structures and derivational steps as parallel as possible to those of examples dealt with in this chapter that illustrate the same syntactic phenomena.

f. Lucy was sent to prison by Judge Bean, and Phil was too.

NOTES

1. In chaps. 2–6 of this book, the choice of categories and the assignment of units to categories will be somewhat arbitrary; it will be considerably less so starting with chap. 7, where a critical reappraisal of the notion "syntactic category" is undertaken and an explicit, though fairly unconventional, policy on the nature of syntactic categories is adopted.
2. One respect in which (1) and the tree diagrams to be given in the remainder of this book are unconventional is that each word and its category are represented

Notes

1. See Percival 1976 for a discussion of how constituent structure came to replace dependency structure as the central notion of syntactic structure in American linguistics, Matthews 1981: chap. 4, for arguments that both constituent structure and dependency structure are essential to an adequate account of syntax, and Hudson 1984 for a detailed account of a number of syntactic phenomena within a somewhat nontraditional version of dependency grammar. •Melcuk•

2. The minimal elements of which the sentence is composed are taken here to be words, though morphemes, e.g. the *listen* and *-ed* of *listened,* could just as well be taken to be the minimal elements and indeed will be below.

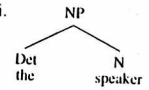
3. The relationship between logical categories and corresponding syntactic categories will be taken up in detail in S7b. What makes the term "noun phrase" misleading is that it is generally taken as covering expressions such as *she* and *that it will rain tomorrow* that do not have a noun as a head, but as not covering expressions such as *tall man* (in *A tall man entered the room*) that do have a noun as head. Other not completely satisfactory alternatives to "noun phrase" are "primary" (Jespersen 1924), "term" (Montague 1971), and actant (Tesnière 1958).

4. Actually, "P" takes in not only prepositions but also postpositions, which come after rather than before their objects but otherwise function syntactically like prepositions. English makes very little use of postpositions (when *notwithstanding* is put after its object, as in *his objections notwithstanding*, it is a postposition), though in many other languages (e.g. Japanese) all Ps follow their objects, and in still others (e.g. Hindi) Ps generally follow their objects though some exceptional Ps precede the object.

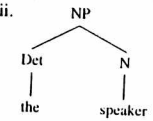
5. The standard term is "prepositional phrase", but in this book I will say instead "preposition phrase" for reasons of terminological uniformity. Technical terms ending in *-al* will relate to syntactic functions rather than to parts of speech; for example, I will distinguish between an "adverb phrase" such as *fortunately for us*, which is a phrasal unit whose head is an adverb, and an "adverbial phrase" such as *for no reason* in *For no reason, he insulted me*, which has an adverbial function (it modifies a S) but has a P and not an Adv as its head and is thus not an Adv' (= adverb phrase).

6. One respect in which (1) and the tree diagrams to be given in the remainder of this book are unconventional is that each word and its category are represented by a single node rather than in the more conventional way in which they are treated as distinct nodes, e.g. this book has diagrams like (i), where most textbooks of generative grammar would have (ii):

i.



ii.



I reject (ii) as conflicting with the interpretation of the lines as meaning 'consists of': the noun in (ii) doesn't **consist of** *speaker*-- it **is** *speaker*. Note that it is not just the fact that the line from N to *speaker* in (ii) does not 'branch' that makes it abnormal to say 'consist of', since it is quite normal to say that in the sentence *Birds fly*, the NP *birds* consists of the noun *birds* and the VP *fly* consists of the verb *fly*. For discussion of the question as to what led generative grammarians uniformly to adopt structures like (ii), see McCawley 1982b:184, where I attributed this puzzling state of affairs to the popularity in early transformational grammar of a notion ('rewriting rule') that is rejected here.

7. In (3), I introduce a common notational device for leaving out details of structure: the triangle indicates e.g. that *in the vase* is a PP but does not indicate what its internal structure is (it does not indicate that it divides into *in* and *the vase*, rather than dividing up in some other fashion). This device will be used both where the structure is so obvious that there is no point in spelling it out in detail (especially when one **has already** spelled it out in detail) and where the structure is so unclear that it would be rash to attempt to give it in full detail.

8. Henceforth I will follow the practice of capitalizing the names of transformations, in conformity with the fact that their names behave syntactically as proper nouns.

9. Another common term for valence is **strict subcategorization**. The notion of valence is applicable not only to verbs but indeed to all elements that can serve as the head of a phrasal unit; for example, some adjectives make up a whole AP (= 'adjective phrase') by themselves (e.g. *tall, probable*), while others combine with a PP into an AP (*eager for adventure, devoid of content*). The notion of valence is a generalization of the traditional distinction between "transitive" and

"intransitive" verbs, which distinguishes between verbs that combine with an "object" (and perhaps additional things) and verbs that do not.

Valence must be contrasted with a second type of restriction on what a lexical item can combine with, namely that of **selection**, that is, a restriction on what can serve as each of the things that the given item is combined with, such as the requirement that the PP with which *put* is combined denote a "destination". Selectional restrictions are in fact generally restrictions not on the syntactic form of the expressions that a given item combines with but on their denotations. For example, the NP which serves as direct object of *subtract* must denote a number, but need not be a number in form; NPs of exactly the same form can differ with regard to whether they denote a number and accordingly differ in acceptability as object of *subtract*:

i. I subtracted 13.5 from 91.2.

ii. I subtracted what I had just computed from 91.2.

ii'. *I subtracted what I had just baked from 91.2.

iii. Nothing greater than 30 should be subtracted from this number.

iii'. *Nothing bigger than a breadbox should be subtracted from this number.

While meaning and denotation thus play a role in determining whether a selectional restriction is satisfied or violated, syntax also plays a role, namely that of determining **which** constituent a given item imposes a selectional restriction on. Note that it is again deep syntactic structure that is relevant: in passive sentences like (10c-c'), the selectional restriction imposed by *subtract* is still on its deep structure direct object even though that NP appears in surface structure as the subject.

10. Or rather, one valence specification for **each sense** of each verb: the different senses of verb may differ with regard to valence, e.g. the two senses of *promise* illustrated below differ with regard to whether they allow allow a *that*-clause and whether they allow a NP in addition:

John promised (us) that he would keep quiet.

The weather promised (*us) to be pleasant.

11. The traditional distinction between transitive and intransitive verbs is a distinction of valence (i.e. does the V combine with a NP and perhaps additional things, or doesn't it?), with the

qualification that for many authors the notion of 'transitive' related to a verb combining not just with any old NP but with a **direct object**, and verbs such as *be* and *become* that combined with a NP that had some relation to the verb other than that of direct object were not classed as transitive. Hopper and Thompson 1980 develop a highly structured notion of transitivity, according to which a verb is transitive to the degree to which its object is syntactically and semantically independent of it and denotes something that is conceived of as 'affected'.

12. The second tree in (9) differs in several respects from what other textbooks present as the surface constituent structure of passive clauses. I offer it here instead of other structures that readers might find less distressing, both in order to stimulate the reader to think about the question of what the constituent structure of passives is and because it is in fact right, as will be argued in chapters 8 and 19; I regard the mitigation of readers' distress as insufficient grounds for the propagation of error.

13. In adopting such an analysis, I am following a policy of identifying phenomena that recur in many types of sentence and describing each in terms of a rule that is general enough to cover the full range of sentences in which the phenomenon occurs and which interacts with rules for each of the specific sentence types. This policy is standard among generative grammarians and will be followed throughout this book; its effect is to require that the relation between deep and surface structure be stated in terms of what may be a large number of steps, with the steps being the same whether they appear in pristine isolation or in combination with other steps, for example, passive constructions will all have derivations involving a step like (9) regardless of what else the passive construction is combined with, which may be quite a bit, as in examples like:

Extravagant claims are thought to be hard for people to be fooled by.

This sentence is in fact a straightforward combination of three syntactic constructions, and the rules for these constructions that will be given (in chapter 4) will not need to be supplemented or altered in order to account for such sentences.

14. Note that in (12b), both *do* and *do*-Past are labeled V. *Do* is inherently a V (in the same way that it inherently begins with a voiced apical stop), and in view of the point made in note 2 that the word and the category make up a single syntactic unit, the unit inserted by *Do*-support includes the category that *do* belongs to. *Do*-Past is a V because inflectional morphemes combine with a word to yield a complex word of the same category as the given word.

15. Note, however, that whether one accepts the metaphor of a grammar as a sentence factory is independent of whether one identifies a grammar with a procedure that is employed in actual language use for constructing sentences. Transformational grammarians have commonly taken grammars to have a form that corresponds to the factory metaphor but have maintained that sentences are produced in some fashion other than sheer replication of the assembly line (which is not to suggest that they have clear ideas as to what that fashion is). For example, transformational grammarians generally recognize that the sequence of steps in a transformational derivation could not possibly correspond to the **temporal** sequence of corresponding mental events, since e.g. one normally starts uttering a sentence before one has fully decided what one is going to say, and thus construction of a whole deep structure cannot yet have been completed when construction of the surface structure begins.

16. I ignore here cases in which, by use of stress and appropriate gestures, one can make two occurrences of *you* in the same sentence differ in reference:

Yóu [points to Alice] defended yóu [points to George].

17. In (8), I introduce the practise of subscripting the labels to facilitate ready reference to one S or another, with $_0$ at the top of the tree and lower nodes bearing larger subscripts than higher nodes. The subscripts are not part of the tree but only an informal device for referring to parts of the tree.

18. The sentential direct object *(that) 700 members of the faculty signed the petition* is labeled NP, in virtue of my policy that "NP" is the syntactic counterpart of the logical category "argument of predicate". The "complementizer" *that* is omitted from (8b) since it is extraneous to the points under discussion; complementizers will be dealt with seriously, starting in chapter 5.

19. *Too* appears in these structures in what is argued in §17e to be the correct position; actually, (14b) is ambiguous with regard to whether *too* is combined with *buy/bought a Mercedes* or with *has bought a Mercedes*.

The analysis of auxiliary verbs is controversial. In chapter 8, I will take up the question of

whether auxiliary verbs such as progressive *be* are heads of VPs, as is implicitly claimed in

20. Strictly speaking, the **copula** *be* is not an auxiliary verb but a main verb, since it is the **only** verb of its clause; however, as will be demonstrated in chapter 8, all uses of *be*, whether as a main or as an auxiliary verb, as well as some main-verb uses of *have*, behave like auxiliary verbs in those phenomena of English syntax in which an auxiliary verb has a special role.

21. The O1 node in (22b) is assumed here to vanish when Tense-hopping applies, eliminating the head of the O′ constituent. The idea of "tree-pruning", in which node are eliminated as they become "nonfunctional" in the course of the derivation" will be taken up in §7c.

22. An argument for treating tenses as underlying heads of phrasal units will be given in chapter 8, in connection with the conclusion that Past in a non-finite S is replaced by *have* (so that e.g. *Bill seems to have gone home an hour ago* will have a deep structure in which the complement of *seem* is *Bill went home an hour ago*, not **Bill has gone home an hour ago*). Since *have* is the head of a phrasal unit in *have gone home an hour ago* and *have* replaces Past, Past must have itself been the head of a phrasal unit in the input to Tense-replacement.

23. One obvious thing that is missing from this derivation is steps in which the complement of auxiliary *have* is put in the past participle form (*given*, rather than *give*); the relevant transformation will be discussed in chapter 8. Here, as before, any of the three "predicate phrases" could in principle be the host of *too*; one of those three possibilities is chosen arbitrarily here. The ? in the surface structures indicates uncertainty as to whether the residue that is left after deleting *given $100 to the March of Dimes* from *given $100 to the March of Dimes too* remains a VP.

24. As Cohen (1976) has pointed out, this well-known sentence demonstrates the falsehood of the remarkably common belief that for a sentence to be given a metaphoric interpretation, its literal interpretation has to be false or nonsensical.

25. I emphasize that this is a statement about **syntax**: that there is nothing in the syntax of any language to exclude negative passives. This leaves open the possibility that the **morphology** of a language might exclude such a combination: if a language marks both passive and negation by inflections on the verb, there is no a priori guarantee that the morphology of the langauge will

provide for negative passive forms.

26. The discussion here relates to 'simple negation', not to 'contrastive negation', as in (1)-(2), in which there is a 'focus'.

27. Actually, it will also have a Q, as in the treatment of questions sketched in §2c, but that point will be ignored here.

28. To a limited extent it is possible to move the whole coordinate expression to the beginning, as in (8b"), which, while not fully normal, is less deviant than (8b').

29. See Dryer (1992:100) for details of a closely related correlation: that between the position of an auxiliary V in relation to its complement VP and the position of a V in relation to its object.

30. To facilitate comprehension by linguists, these axioms are stated in terms of notions directly relevant to linguists rather than the somewhat different notions that are more common in graph theory.

31. Note that only the nodes, not the branches, are ordered, notwithstanding the appearance that diagrams give of representing left-to-right order among the branches as well as among the nodes.

32. 'Dominates' is defined in terms of 'directly dominates' in the obvious way: x dominates y if x directly dominates y, or directly dominates a node that directly dominates y, or directly dominates a node that directly dominates a node that directly dominates y, or ...

33. In (2b), arrowheads are used as a makeshift device to indicate which node directly dominates which. The usual typographical convention is to print diagrams with the dominating node higher than the dominated node, but it is only in virtue of axiom ii that that convention can be used, and we thus cannot rely on that convention in illustrating a violation of axiom ii.

34. In §16a I will in fact admit a limited class of structures that violate iii. However, since the need for such structures will not arise for several chapters, I will ignore that possibility in the earlier chapters of this book.

35. The subscripts on the node labels in (6) are informal typographical devices for identifying the nodes. The labels are insufficient identification, because a tree may contain several nodes with the same label, as here, where three nodes are labeled A and two are labeled C.

3. Some tests for deep and surface constituent structure

a. The rationale for tests for constituent structure

Any syntactic rule can in principle serve as a test for constituent structure, since everything in syntax is sensitive to constituent structure: for any syntactic rule, it is no doubt possible to find cases where some combination of elements can be shown to be a constituent or not to be one in virtue of that rule being applicable or not being applicable. The purpose of this chapter will be to identify certain tests for constituent structure that are of particularly broad applicability and to make clear what inferences one can draw from these tests and why those particular inferences are legitimate.

Many tests for constituent structure test whether something is a constituent by testing whether a particular transformation is applicable to structures containing it, as in the many cases below in which we will test whether something is a V' by testing whether it can be deleted by V'-deletion. For example, we can conclude that an expression such as *play poker on Fridays* is a V' that contains a smaller V' (*play poker*), since either of those two expressions can be deleted by V'-deletion:

(1) a. John plays poker on Fridays, and Nancy does Ø too.

b. John plays poker on Fridays, and Nancy does Ø on Saturdays.

In using this test, we are relying on a generalization about what V'-deletion does and the respect in which it is sensitive to constituent structure: it applies to a structure containing two identical V's and deletes one of them, and thus the material that it deletes has to be a constituent.

Other transformations depend on constituent structure in different ways. For example, **Stripping** applies to a two-term coordinate structure whose conjuncts are identical except for one constituent where they contrast, and deletes all of the second conjunct except for the contrasting constituent:

(2) a. John plays poker on Fridays, and bridge too.

a'. John plays poker on Fridays, but not bridge.

Here the material deleted need not be a constituent, but the material retained (excluding items such as *too* and *not* that are allowed to go along for the ride) does have to be a constituent. Thus,

the possibilities for Stripping can be used to test whether the material retained is a constituent but provide no information as to whether the material deleted is one. For example, the difference in acceptability between (3a) and (3b) provides evidence that the sequence of P's in the one is a constituent and the sequence of P's in the other is not:

(3) a. John drives from Boston to New York in three hours, but not from Chicago to St. Louis.

b. ??John talks to his father about politics, but not to his mother about religion.

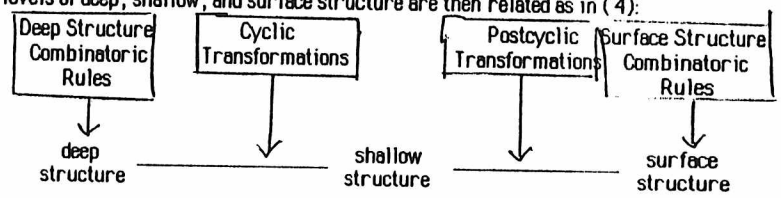
The material deleted (*John drives in three hours*; *John talks*) is not a constituent, but with Stripping, there is no reason for it to be one.

Since the scheme of syntactic analysis assumed here involves derivations with potentially many steps, one needs to raise the question of **what** stage in the derivation a particular test yields information about. In view of the cyclic principle, we can infer that tests involving the applicability of cyclic transformations (such as V'-deletion or Stripping) yield information about surface structure. Specifically, the transformation will generally have as its domain a S that properly contains the Ss whose constituency is being tested, as in the case of V'-deletion, where the domain to which it applies (S_0) properly contains the two Ss (S_1, S_2) whose constituency determines the applicability of V'-deletion. Any cyclic transformations that apply to S_1 or S_2 thus will already have applied before V'-deletion gets its chance to apply with S_0 as domain, and thus the constituent structure that is being tested is what would be the surface structure of S_1 or S_2 were the whole sentence and not embedded in a larger structure.

Actually, subsequent to the application of cyclic transformations with S_0 as domain, the constituent structure of S_1 or S_2 could be altered by a postcyclic transformation. Thus, strictly speaking, the applicability of cyclic transformations provides information not about surface structure but about the level of structure that is the output of the cyclic transformations and the input of the postcyclic transformations; the obvious name for that level is **shallow structure**.

The levels of deep, shallow, and surface structure are then related as in (4):

(4)



Here the boxes indicate systems of rules, and the arrows indicate what each system of rules determines, e.g. the cyclic transformations determine the relationship between deep structure and shallow structure. We can then say that the applicability of a cyclic transformation such as V' -deletion allows us to infer that the affected material is a constituent in shallow structure. Whether we can infer that it also makes up a constituent in surface structure, or in deep structure, will depend on whether we can assume that surface structure, or deep structure, does not differ from shallow structure in that respect.

Different kinds of tests will allow inferences to be drawn about deep structure. In §11c it will be argued that there are two kinds of pronouns: "derived" pronouns, which are derived by transformations that replace one of two identical items, thus potentially yielding information about surface structure, and "essential" pronouns, which are not so derived and which have constituents of deep structure or of semantic structure as antecedents. Accordingly, it is often possible to test for details of deep constituent structure by seeing what can be the antecedent of an "essential" pronoun. For example, the possibility of using *I doubt it* in (5) to mean that I doubt that I am wrong provides evidence that *I may be wrong* has a deep structure in which *may* is combined with the structure that underlies *I am wrong*:

(5) I may be wrong, but I doubt it.

There will be relatively few details of deep stucture, however, that can be resolved on the basis of such pronouns, since relatively few kinds of constituents can serve as antecedents of pronouns. A far richer source of information about deep structures is elements (such as the "ambient *it*" of *It's raining* and pieces of idioms such as *X's leg* in *pull X's leg*) that are "licensed" only by a limited range of elements and which must be combined directly with those elements in underlying structures even though they can be widely separated from them in surface structures. For example, one piece of evidence that the subject of a passive clause is an underlying constituent of the V' is the acceptability of sentences such as (6) in which a piece of an idiom is the subject and the rest of the idiom is in the V'.

(6) My leg was being pulled.

If the parts of *pull X's leg* have to be together in underlying structure, then (6) has to have an

underlying structure in which *my leg* is combined with *pull* in a V' and there has to be a transformation that extracts that NP from the V'. Similarly, if the parts of the idiom *The cat is out of the bag* have to be together in underlying structure, a sentence like (7) requires an underlying structure in which *seem* is combined with a S, and there has to be a transformation that separates the subject of that S from its V', thus yielding sentences such as (7) in which the subject and V' of *The cat is out of the bag* are separated:

(7) The cat seems to be out of the bag. (In the sense: it seems as if the secret has been revealed.)

Such a deep structure, and the same transformation, are likewise needed in order to provide a derivation for (8) if ambient *it* and its licensing element (here, *rain*) have to be together in underlying structure:

(8) It seems to be raining.

In the last paragraph I have been speaking of underlying structure rather than deep structure, since the constituents whose existence is inferred will not always be deep structure constituents. For example, one of the elements which has to combine directly with a limited range of licensing elements is existential *there*, which will not even appear in the deep structures that will be argued for below but will be inserted by a transformation:

(9) There seems to be someone waiting outside.

However, the distribution of existential *there* will still provide information about deep structure, since it will provide evidence that *seem* combines with a S in deep structure: there has to be a S in which *there, be*, and *someone* are together in the **output** of the *There*-insertion transformation, and that S will correspond to a S in deep structure, albeit one having a quite different internal structure.

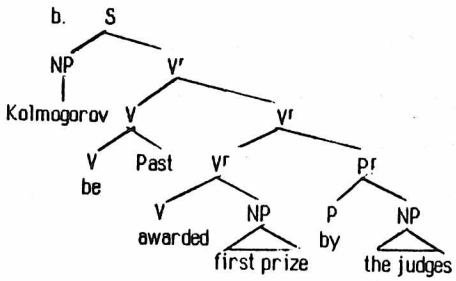
b. Some tests for shallow constituent structure

In this section, I will survey some syntactic phenomena that provide particularly useful tests for shallow constituent structure. The main source of such tests will be cyclic transformations, and the cyclic principle provides the rationale for why these tests yield information about shallow structure. For example, the applicability of V'-deletion in S3a(1a) to a domain that properly contained two occurrences of *play poker on Fridays* allows us to infer not only that *play poker on Fridays* was a constituent in the input to V'-deletion but also that it is a V' in the shallow structure of *John/Nancy plays poker on Fridays*: the constituent structure of *John/Nancy plays poker on Fridays* as parts of the complex structure that is the input to V'-deletion will be the same as the shallow structure of *John/Nancy plays poker on Fridays* as an independent sentence.[1] The deep structure of *John plays poker on Fridays* is not directly relevant to this application of V'-deletion, since any cyclic transformations having that S as domain will have already applied before V'-deletion gets its chance to apply. It will eventually be argued that such a cyclic transformation is relevant here: *on Fridays*, while a V'-modifier in the input to V'-deletion, is a deep-structure S-modifier, and a transformation converting S-adjuncts optionally into V'-adjuncts will apply in both conjuncts in the derivation of S3a(1a). In this section we will take up a number of constructions in which cyclic transformations have a role that makes the constructions useful tests for shallow constituent structure.

i. Coordinate structures

The possibility of conjoining two or more expressions can be used as evidence that those expresions are syntactic constituents. For example we can argue that a passive sentence such as (1a) has a constituent structure with nested V's, as in (1b), on the grounds that each of the expressions identified there as a V' can be conjoined with like expressions:

(1) a. Kolmogorov was awarded first prize by the judges.



(2) a. Kolmogorov [was awarded first prize by the judges] and [was featured in a CBS special].

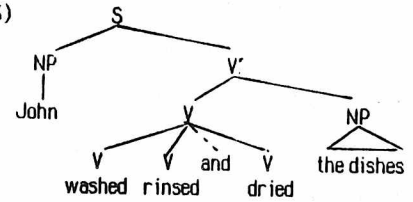
b. Kolmogorov was [awarded first prize by the judges] and [given a five-year contract by Sol Hurok].

c. Kolmogorov was [awarded first prize] and [given a special commendation] by the judges.

(The interpretation of (2c) that is relevant here is the one in which the judges both award the prize and give the commendation.) Several arguments for a structure as in (1b) will in fact be given in the course of this book.

It will be argued in chapter 9 that the conjoined V' s that figure in (2a-c) are derived from conjoined Ss by a (cyclic) transformation of **Conjunction-reduction** (**CR**), which applies to a coordinate structure whose conjuncts contrast in one position (e.g. *John washed the dishes, he rinsed them, and he dried them*), replacing it by a "simple" structure in which the contrasting parts are conjoined (here, *John washed, rinsed, and dried the dishes*).[3]

(3)



The application of CR in the derivations of the three sentences in (2) will be contingent on the bracketed expressions being constituents in the input to CR. CR is also involved in the derivations of sentences such as the following:

(4) a. His left leg, his jaw, and one of his fingers were fractured.

b. The male and female employees are paid equally.

In (4b), the domain to which CR applies is not a conjoined S but rather a conjoined NP, as in (5a);

note that (5a') has a very different meaning from that which (4b) would normally convey).

(5) a. The male employees and the female employees are paid equally.

a'. The male employees are paid equally and the female employees are paid equally.

In fact not all conjoined constituents of Ss can be derived from conjoined Ss through CR, as is shown by (5a) (at least, in the interpretation in which it is paraphrased by (4b): it also has an interpretation like that of (5a')) and by examples as in (6):

(6) a. The king and the queen are an amiable couple.

b. Bush or Clinton was a depressing choice.

The question of which conjoined constituents can be derived from conjoined Ss will be postponed until chapter 9. However, the lack of a resolution of this issue will not affect the utility of conjoining as a test for constituency, since even the conjuncts of a non-derived coordinate structure will have to be constituents.

The argument for the structure (1b) cannot be just as simple as pointing out that examples as in (2) are acceptable, since ~~it is possible to give~~ examples as in (7), ~~in which~~ an expression that is not a constituent according to the structure in (1b), namely *Kolmogorov was awarded first prize*, nonetheless appears to be conjoined with another such expression:

(7) [Kolmogorov was awarded first prize] and [Pak was awarded second prize] by the same judges who had disqualified both of them in last year's competition.

(Again, what is at issue is an interpretation in which the *by*-phrase goes with both conjuncts, not just with the second.)

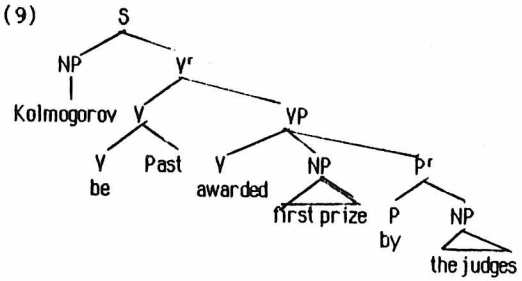
Examples such as (7) do not in fact conflict with the structure in (1b), since they reflect not CR but a different process of "simplifying" coordinate structures, namely **Right-Node-Raising (RNR)**, in which a shared final constituent in a coordinate structure is factored out, as in (8):

(8) a. John manufactures, and Mary sells, washing machines.

b. John manufactures, but he has a great deal of trouble getting anyone to buy, washing machines that run on solar power.

For RNR to apply, it is not necessary that the final constituent even have the same syntactic role in the different conjuncts (here it is in the main clause in the first conjunct but in a subordinate clause in the second conjunct), only that it be at the end of each constituent, and the residues left by RNR (such as *John manufactures*) need not be constituents in the input to RNR. We can accordingly say that (7) is consistent with a structure as in (1b), since it can be derived by an application of RNR that factors out a shared *by*-phrase. However, this means that the acceptability of (2c) is not enough to establish that *awarded first prize* is a constituent in (1a), since for all we know, (2c) could be derived by RNR, applying to factor out *by the judges* from the two conjuncts, in which case *by the judges* could be anywhere in the structure, e.g. the constituent structure could as well be (9):

(9)



The difficulty in marshalling facts about conjoining to determine where the *by*-phrase fits into the structure points to a fact of life that will both add to the number of ways in which coordinate structures can be used in testing for constituency and make it difficult to determine what implications, if any, a particular coordinate example has for constituent structure. Each of the mechanisms that English has for avoiding repetition in coordinate structures provides a useful test of constituent structure, but before they can be used as tests of constituency, we must determine the respects in which each of them is sensitive to constituent structure (e.g. determine whether, as was stated above, the material factored out by RNR has to be a constituent but the material left behind need not be). It will in fact be worthwhile to discuss these devices together so as to reduce the likelihood of confusion among them and accordingly to avoid the drawing of incorrect inferences from facts about coordinate structures.

Let us start with RNR. The item extracted by RNR must in fact be a constituent and not just a string of adjacent items. For example, the NP and P' at the end of (10a) presumably do not make

up a single constituent, and while the P' can be extracted by RNR (10b), the two together cannot (10c):[4]

(10) a. Smith sells luxury cars to insurance executives.

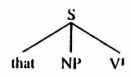
b. Smith sells luxury cars, and Jones rents pickup trucks, to insurance executives.

c. *Smith sells, and Jones rents, luxury cars to insurance executives.

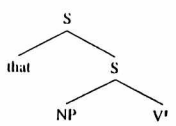
This characteristic of RNR has been useful in resolving some difficult questions of constituent structure, for example, the question of whether a 'complementizer' such as *that* in (11a) is inside (11b) or outside (11b') the subordinate clause that it introduces:

(11) a. I wouldn't suggest that John was contributing too little.

b.



b'.



c. I wouldn't even wonder whether, let alone suggest that, John was contributing too little.

Bresnan (1974) used examples such as (11c) to argue that the constituent structure is as in (11b') rather than (11b): if the NP V' part of a *that NP V'* sequence were not a syntactic constituent, then (11c), in which the NP and the V' but not the *that* are extracted by RNR, ought to have the same sort of oddity as does (10c).

A third mechanism for "simplifying" coordinate structures has already been taken up, namely Stripping, which applies to a two-term coordinate structure whose conjuncts are identical except for one constituent where they contrast (and some additional elements in the second conjunct such as *not* and *too* that are also allowed) and deletes the repeated matter, thus reducing the second conjunct to the contrasting item. Here the material retained has to be a constituent, but the material deleted need not be:

(12) a. Smith sells luxury cars to insurance executives, but not pickup trucks.

b. ??Smith sells luxury cars to insurance executives, but not pickup trucks to farmers.

A fourth way of simplifying coordinate structures is through **Gapping**, in which a coordinate structure whose conjuncts contrast in two positions is subjected to a deletion of the non-contrasting parts of the second and subsequent conjuncts:

(13) John gave $50 to the Cancer Foundation, Mary $100, and Ted $75.

Gapping is similar to Stripping in deleting all of a constituent except for contrasting items, but different from it in not being restricted to two-term coordinate structures (note that (13) involves the conjoining of three Ss) the way that Stripping is:

(14) ??Smith sells luxury cars to insurance agents, pickup trucks too, and mobile homes as well.

There is some controversy as to what range of "simplified" coordinate structures can be subsumed under Gapping, but in the cases that are generally agreed to be instances of Gapping, one of the two contrasting constituents is outside the predicate phrase (most commonly, it is the subject) and the other is a non-predicate constituent within the predicate phrase (underlining here indicates the contrasting constituents):

(15) a. John managed to find time to start writing a novel, and Mary a movie script.

b. On Tuesdays, Lucy practices the piano, and on Wednesdays the clarinet.

b'. ??On Tuesdays, Lucy handles customers' complaints, and on Wednesdays George.

Gapping in those idiolects in which the affected conjuncts are reduced to precisely two contrasting constituents (cf. note 4) can thus provide a test of whether two adjacent items make up a constituent, since if they do not, they cannot be the residue to which Gapping reduces the predicate phrase:

(16) *John talked with his father about politics, and Mary with her mother about religion.

The possibilities for Gapping confirm that the two P's in *from X to Y* form a constituent, unlike the sequence of P's in (16), and the lower acceptability of examples with *to X from Y* suggests that that the two P's in that combination do not make up a constituent:

(17) a. John often drives from Baltimore to Washington, and Mary from Providence to Boston.

b. ??John often drives to Washington from Baltimore, and Mary to Boston from Providence.

An important qualification to the use of coordination as a test for constituent structure is raised by sentences as in (18), in which each conjunct consists of two constituents of the V' that do not comprise a single constituent as far as we can tell from other tests of constituency:

(18) a. John donated $50 to the Anti-vivisection Society and $75 to the Red Cross.

b. I put the potatoes in the pantry and the milk in the refrigerator.

These sentences have been held by some authors to be instances of Gapping (in which case, the claim that one of the retained constituents must be outside of the predicate phrase has to be rejected) and by others to be instances of CR (in which case, the claim that the derived conjuncts have to be constituents in the input to CR has to be rejected), there is no consensus as to their analysis. In any event, they pose an obstacle to the use of conjoining as a test for constituency, since their appearance is that of structures in which nonconstituents serve as conjuncts. However, a useful test for constituency can be salvaged even in the face of examples as in (19), since such examples do not allow the otherwise generally available option of putting *both, either*, or *neither* before the first conjunct:

(19) a. John donated money both to the Anti-Vivisection Society and to the Red Cross.

a'.??John donated both $50 to the Anti-Vivisection Society and $75 to the Red Cross.

b. I didn't put either the potatoes or the milk in the refrigerator.

b'.??I didn't put either the potatoes in the pantry or the milk in the refrigerator.

Thus, notwithstanding the acceptability of (18a), the substantially lowered acceptability of (19a') is evidence that *$50 to the Anti-Vivisection Society* is not, after all, a constituent in the input to CR.

ii. Cleft and pseudo-cleft constructions

English has two related constructions in which a constituent of a corresponding simpler sentence appears in predicate position. One is the **cleft** sentence, which has *it* as its subject and what appears to be a relative clause at the end:

(20) a. John wants to look at your notes.

a'. It's your notes that/which John wants to look at.

a". It's John that/who wants to look at your notes.

b. Ann bought a first edition of *Naked Lunch* for $500.

b'. It was Ann that/who bought a first edition of *Naked Lunch* for $500.

b". It was a first edition of *Naked Lunch* that Ann bought for $500.

b"'. It was *Naked Lunch* that Ann bought a first edition of for $500.

b"". It was for $500 that Ann bought a first edition of *Naked Lunch*

The other construction is the **pseudo-cleft** sentence, in which what looks like an interrogative clause appears in subject position:

(21) a. What John wants to look at is your notes.

b. What Ann bought was a first edition of *Naked Lunch*

Note the use of *what*, which is normally an interrogative and not a relative pronoun; by contrast, clefts allow *which*, which can normally be only a relative pronoun unless combined with a noun:

(22) a. What did John look at?

a'. the portrait which/*what John was looking at

b. Which did John look at? (requires understood noun: *Which portrait*, etc.).

Cleft and pseudo-cleft constructions fulfill similar functions of 'focusing' a constituent of the corresponding simpler sentence, i.e. (20a') and (21a) both present the information contained in (20a) as an answer to an implicit question *What does John want to look at?*, though the two constructions differ considerably with regard to the class of cases in which they can be employed. In general, the cleft construction is more widely applicable, in that the predicate constituent of a cleft construction can be of any category that is otherwise admissible in predicate position (thus, not only NP but also P', A', and Adv), while the pseudo-cleft construction is more restricted in this regard; and (though there is much regional and individual variation on this point) the pseudo-cleft construction for many speakers requires *what*, and correspondingly the predicate element is restricted to constituents of types that can serve as answers to a question with *what*:

(23) a. It's Alice that John was talking to.

a'. %Who John was talking to is Alice.

b. It's to Cleveland that John drove the truck.

b'. %Where John drove the truck is to Cleveland.

c. It's because he was tired that John yelled at you.

c'. %Why John yelled at you is because he was tired.

d. It was very carefully that Marge handled the sulfuric acid.

d'. %How Marge handled the sulfuric acid was very carefully.

e. ?It was deathly afraid of flying that John became.

e'. What John became was deathly afraid of flying.

f. It was for a good reason that I stopped you.

f'. *Why I stopped you was for a good reason.

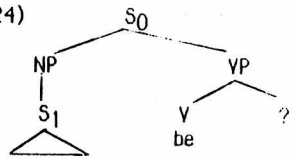
g. It was for two hours that his speech lasted.

g'. *How long his speech lasted was for two hours.

These two restrictions on the pseudo-cleft construction are of course related: some of the constituent types that may not appear in predicate position in the pseudo-cleft either have no corresponding interrogative expression at all or (in the case of dialects that demand *what*) correspond to some interrogative expression other than *what*. By contrast, the apparent relative clause of the cleft construction allows the option of using *that* instead of a true relative pronoun and thus allows one to evade the requirement that the relative pronoun match the focused constituent.

It is far from clear what the deep structures of cleft and pseudo-cleft sentences should be, and no specific deep structure will be proposed here. However, since their surface structure clearly has the form of a S containing a subordinate S that matches the corresponding non-cleft S, we can plausibly at least claim that the deep structure is of the gross form in (24), with S_1 being the deep structure of the non-cleft counterpart and S_0 being the domain to which a transformation applies, moving the focused expression out of S_1 and into the predicate position of S_0:[5]

(24)



It is in view of this transformation that cleft and pseudo-cleft constructions provide a test for shallow constituent structure: the transformation that extracts the focused constituent from S_1 will apply with S_0 as its domain and thus will apply subsequently to any cyclic transformations that apply with S_1 or any of its parts as domain.

The only case taken up so far in which a pseudo-cleft is more acceptable than a corresponding cleft is (23e), where the focused constituent is an A'.[6] An important additional case of that type is where the focused constituent is a *that*-clause or an infinitival clause:

(25) a. ??It's that he wants to quit school that Fred told us.

a'. What Fred told us is that he wants to quit school.

b. ??It's to submit her manuscript to Fortune that Alice intends.

b'. What Alice intends is to submit her manuscript to Fortune.

The oddity of (25a,b) reflects not a restriction specifically on the cleft construction but the more general constraint against subordinate clauses in the middle of a surface constituent,[7] illustrated in (26):

(26) a. Bill told that lie to Alice.

b. *Bill told that Fred had quit school to Alice.

b'. Bill told Alice that Fred had quit school.

Since the focused constituent is at the end of the pseudo-cleft construction but in the middle of the cleft construction, such a constraint would restrict the occurrence of a clausal focused constituent in the cleft construction but not in the pseudo-cleft.

In either case, however, only a single constituent, not a sequence of two or more separate items, may occur as the focused item, and it is this characteristic that gives cleft and pseudo-cleft constructions considerable utility as a test for constituent structure:

(27) a. I gave a watch to my brother.

a'. *It was a watch to my brother that I gave.

a". *What I gave was a watch to my brother.

b. Jack threw the wrappings into the wastebasket.

b'. *It was the wrappings into the wastebasket that Jack threw.

b". *What Jack threw was the wrappings into the wastebasket.

c. I saw Venus through a telescope last Tuesday.

c'. ??It was through a telescope last Tuesday that I saw Venus.

This fact can be used, for example, to argue that *for NP to NP* in (28a) is a constituent.

(28) a. Johann Sebastian Bach lived in Leipzig from 1723 to 1750.

b. It was from 1723 to 1750 that Johann Sebastian Bach lived in Leipzig.

The reason that I have contrasted the possibilities for cleft and for pseudo-cleft constructions is to provide a rationale for choices of one rather than the other of them as having a bearing on a particular question. For example, in deciding whether the *for NP to V'* combination of examples like (29a) forms a constituent, we must look at pseudo-cleft constructions like (29b) rather than cleft constructions like (29c), because (29c) will be unacceptable regardless of whether *for NP to V'* makes up a constituent, since clausal focused constituents in cleft constructions violate the 'internal S constraint':

(29) a. I hate for people to play radios on buses.

b. What I hate is for people to play radios on buses.

c. *It's for people to play radios on buses that I hate.

The acceptability of (29b) provides an argument that *for people to play radios on buses* is a constituent in (29a); the unacceptability of (29c), which one might conceivably offer as evidence for the contrary conclusion, actually shows nothing, since it would be unacceptable irrespective of whether *for people to play radios on buses* is a constituent.

iii. Derived anaphoric devices

It was noted in §3a that pronouns, or more generally, **anaphoric devices** (**ADs**), that is, words, expressions, and constructions that refer to an **antecedent** elsewhere in the sentence or discourse and take their reference from that antecedent, are of two major types: **essential** ADs, which have a deep structure antecedent and are not derived by a transformation, and **derived** ADs, which are derived through cyclic transformations that apply to a structure containing two identical constituents, replacing one of them by the AD.

The derived AD par excellence is in fact the zero V' that is derived by V'-deletion, which has figured prominently in both this and the preceding chapter and is further illustrated in (30):

(30) a. Frieda <u>finished</u> <u>the assignment</u>, but Walter didn't Ø.

b. I didn't think I'd <u>get here on time</u>, but I did Ø.

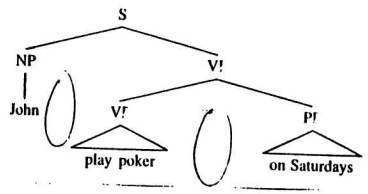
c. Anyone who wants to Ø can <u>come along on the trip.</u>

d. While you were <u>playing poker</u>, I was Ø too.

We have already shown how V'-deletion can be used in arguing that certain kinds of adverbials are adjuncts to V's, and thus (31a) must have a shallow constituent structure like (31b):

(31) a. John plays poker on Saturdays.

b.



iv. Placement of elements with focus

There are a number of words in English (*only, even, too, also*) that are associated with a **focus**: an item that is implicitly contrasted with other items, as in *John drinks only beer*, where *only* serves to contrast *beer* with such other items as *wine* and *vodka*, i.e. *John drinks only beer* says that John doesn't drink wine, that he doesn't drink vodka, etc. *Only* usually precedes its focus but need not **immediately** precede it; for example, *John only drinks beer* can be interpreted with *beer* as focus even though *only* is separated from it by *drinks*. Actually, it is necessary to distinguish a number of different ways of pronouncing that sequence of words, since different placements of stress correspond to differences of focus:

(32) a. John only drinks béer. (focus = *beer*)

b. John only drínks beer. (focus = *drinks*)

c. John only drînks béer. (focus = *drinks beer*, i.e. he doesn't smoke pot or gamble)

The focus must always bear primary stress. In subsequent examples, I will use underlining to indicate the intended focus, restrict my attention to pronunciations with stress appropriate to that focus, and give acceptability judgements only for interpretations in which the underlined item is the focus.

While *only* can be separated from its focus, as it is in (32a), it cannot be put in front of

just any matter that precedes the focus:

(33) a. John only put flowers in the vase.

a'. *John put only flowers in the vase.

b. John only accused Bill of negligence.

b'. John accused Bill only of negligence.

b". *John accused only Bill of negligence.

Only can appear at the beginning of a P' containing the focus, or at the beginning of a V' containing the focus. However, it can't appear before an item preceding the focus unless there is at least arguably a constituent beginning with that item and containing the focus, e.g. in (33b") it is unlikely that *Bill of negligence* could be a constituent.

I will tentatively adopt the hypothesis that *only* can appear only as a left sister of a constituent containing the focus. *Only* is in fact subject to some other restrictions; for example, the constituent that it precedes cannot be a S:

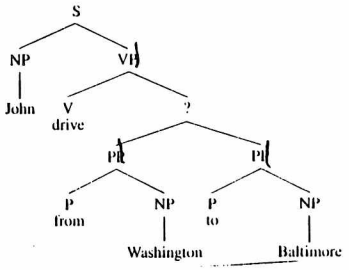
(34) *Only John drinks beer.

As long as these latter restrictions are not violated, the inadmissibility of *only* in a given position can be taken as evidence that that position does not begin a constituent containing the focus. For example, the difference in acceptability of *only* noted in (35) is evidence for the difference in constituent structure suggested in (36):

(35) a. John drove only from Washington to Baltimore.

b. *John drove only to Baltimore from Washington.

(36) a.



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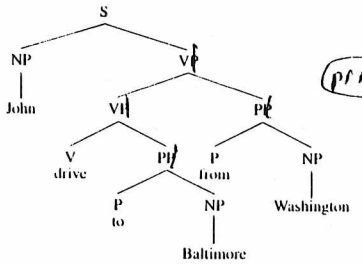
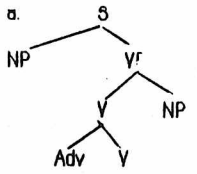


Since the places where *only* can go are the **beginnings** of constituents that contain the focus, facts about its placement can bring out differences in constituent structure that correspond to differences in where constituents begin. For example, an adverb that immediately precedes a

transitive verb could conceivably be a modifier either of the verb or of a V' of which that verb is the head:

(37) a.



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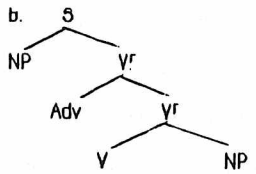


If the Adv modifies the V', as in (37b), the verb is the first element of a constituent that contains the direct object of the verb, but if the Adv modifies the V, as in (37a), the verb is not the first element of such a constituent. The observations in (38) provide evidence that *deeply* in (38a) is a V-modifier, while *intentionally* in (38b) is a V'-modifier, so that the constituent structures differ as in (39a-b):

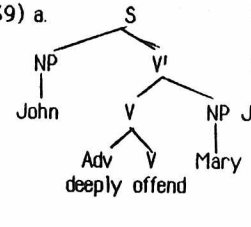
(38) a. John only deeply offended Mary.

a'. *John deeply only offended Mary.

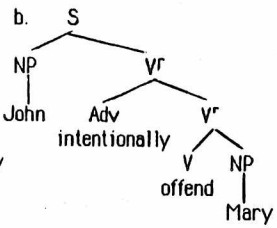
b. John only intentionally offended Mary.

b'. John intentionally only offended Mary.

(39) a.



b.



The possibilities for placing *only* in (38a-a') argue that only the position before *deeply* and not the position after it is the beginning of a V' containing the focus, *Mary*, as in the structure (39a), while the acceptability of *only* on either side of *intentionally* in (38b-b') argues that both positions are the beginnings of V's containing *Mary*, as in the structure (39b).

I leave it to the reader to verify that everything said in this chapter about where *only* can occur in relation to its focus also applies to *even*. *Too* and *also* likewise have a focus, but differ from *only* and *even* in that whereas *only* or *even* normally must precede its focus, *too* or *also* must follow its focus except that *also* may precede a V' or S that it is attached to:

(40) a. John kicked Sam too.

b. John admires Hitler also.

b'. John also admires Hitler.

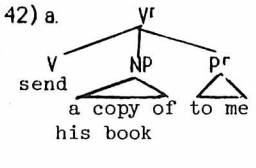
This difference among the various focus-bearing elements implies that *too* and *also* will yield information about constituent structure in different classes of cases than will *only* and *even*.

Facts about elements that follow their foci (*too* and sometimes *also*) are of relevance to establishing where a constituent **ends**. For example, it is often not obvious whether a given V NP P' sequence is simply a V' in which the three items are sisters or consists of a [V' V NP] constituent modified by a P'. If *too* with the verb as focus can appear between the NP and the PP, then that position must be the end of a [V NP] constituent and the P' must be outside that constituent. It is much harder to construct plausible examples in this case than it was when we were working with *only*, since we need to have the verb as the focus, and it is often difficult to construct examples where the verb (NB, just the verb, not the whole V') is implicitly contrasted with alternatives. The difference between (41a) and (41b) (where the implicit contrasts are, say, between sending a copy of the book to me and showing one to me, and between writing a poem for me and reciting it for me) provide evidence that *send X to Y* has a constituent structure as in (42a) and *recite X for Y* has a structure as in (42b).

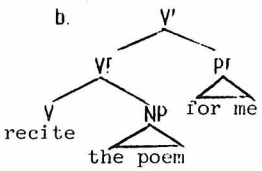
(41) a. *He sent a copy of his book too to me.

b. He recited the poem too for me.

(42) a.



b.



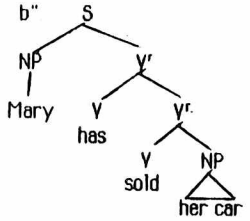
To illustrate the use of the constructions considered in this section as tests for constituent structure, let us see whether they support the by now familiar claim that a V and its objects form a constituent. We have already seen examples in which such a combination of elements appears as a conjunct in a coordinate structure, to which we can add examples involving auxiliary verbs that evidently involve what we are calling a V' embedded within a larger V':

(43) a. John [[got a job with General Motors] and [moved to Detroit]].

b. Mary has [[sold her car] and [bought a motorcycle]].

b'. Mary [[has sold her car] and [is trying to sell her house]].

b"



The sorts of constituents identified here as V' s can undergo RNR or be the residue that a larger V' is reduced to by Stripping or Gapping.

(44) a. Mary wouldn't consent, and John flatly refused, to give me more money.

b. John has been taking drugs recently, and gambling too.

c. John has been gambling, and Mary taking drugs.

We have already seen numerous examples of V' -deletion, in which one of two identical expressions of the sort under consideration is deleted, and of the boundaries of such an expression being the positions to which items whose foci are within that expression can be moved. Cleft and pseudo-cleft constructions in which a V' fills the focus position are not possible in standard varieties of English; however, the lack of acceptable examples of that sort is presumably due to restrictions on the type of constituent that those constructions allow in the focus position rather than to the expression in question not being a constituent.

Finally, let us see what our tests tell us about the constituent structure of such sentences as:

(45) a. John picked up the money.

b. John ran up the stairs.

Let us first test whether the *up + NP* combinations can be conjoined with similar combinations:

(46) a. *John picked up the money and out a coin. (cf. John picked up the money and picked out a coin).

b. John ran down the corridor and up the stairs.

The *up + NP* combination of (45b) behaves like a unit in allowing conjoining with something

similar, while that of (45a) does not. Sentences as in (47) illustrate the application of RNR to such combinations:

(47) a. *John picked, and Mary hoisted, up some heavy weights. (cf. John picked up, and Mary hoisted up, some heavy weights).

b. John ran, and Bill walked, up the stairs.

Again, *up + NP* behaves like a unit in a combination as in (45b) but not in one as in (45a). The possibilities for Gapping also show *up + NP* behaving like a unit in the former combination but not the latter (examples modeled after Takami 1992:91):

(48) a. John ran up the stairs and Mary up/??Ø the ramp.

b. John looked up the prices and Mary (*up) the schedules.

The following examples show what happens when one makes such a combination the predicate constituent of a cleft construction:

(49) a. *It was up the money that John picked.

b. It was up the stairs that John ran.

Again, the *up + NP* combination of (45b) behaves like a unit and that of (45a) does not.

There is no way to test the possibility of replacing these combinations by ADs, since there is no AD whose meaning could plausibly represent the combinations that we are testing. (Note that this does not imply that they are not constituents -- we have no assurance that there need be a full inventory of ADs to match all the different types of constituents that there are). Let us thus turn to the placement of *only* or other focus-bearing elements. The following examples illustrate what happens when an *only* that has as its focus the NP of an *up NP* combination is put before the verb or before the *up*:

(50) a. John only picked up the money (*not out a coin too).

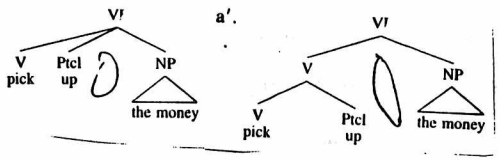
b. John only ran up the stairs (not down the corridor too).

(51) a. *John picked only up the money.

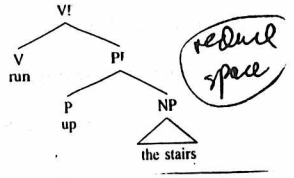
b. John ran only up the stairs.

In both cases, *up the stairs* of (45b) displays behavior characteristic of the focus of *only*, but *up the money* of (45a) does not. the focus in *John picked up the money* can be *the money* but not *up the money* (note the unacceptability in (50a) of a contrasting phrase that would match *up the money* rather than just *the money*), while *up the stairs* can be contrasted with *down the corridor* in (50b), and *only* can precede *up* in (51b), just as it should if *up* there is a preposition with the focus as its object, while it cannot precede it in (51a).

The five tests that yielded any results confirm a well-known analysis (Fraser 1976, Bolinger 1971), according to which *pick up the money* is a **Verb-particle construction**, with a structure as in (52a) or (52a'), in which the NP and the 'particle' do not comprise a constituent, while *run up the stairs* consists of a verb and a prepositional phrase:

(52) a. 

a'.

b. 

This conclusion is confirmed by the interaction of these constructions with a number of other syntactic phenomena. For example, prepositions normally can accompany their objects when an interrogative expression is moved to the beginning of a question (53a), and in this respect (45b) but not (45a) behaves as if *up* is a preposition and the following NP is its object:

(53) a. To which person did you give the money?

b. *Up how much money did John pick?

b'. Up which staircase did John run?

If *to NP* in (53a) and *up NP* in (53b') were not constituents, the examples would not conform to the normal rationale for the extra element to accompany the moved interrogative element: moved elements may or must "drag along" various elements that they are combined with syntactically.

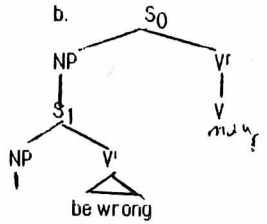
c. Tests for deep constituent structure

i. Essential anaphoric devices

As was stated in §3a, ADs divide into two types, derived and essential ADs, and essential ADs, since their antecedents correspond to constituents of deep structure, can sometimes provide evidence as to details of deep structure. It will not be until chapter 11 that we justify the distinction between derived and essential ADs and identify a number of essential ADs; however, we have already seen one example where a detail of a putative deep structure can be justified by noting that that constituent can be the antecedent of an essential AD. Specifically, the interpretation of *it* in (1a) provides evidence for an analysis in terms of an underlying structure such as (1b) in which the auxiliary verb is outside of its surface clause:

(1) a. I may be wrong, but I doubt it.

b.



The *it* refers not to the proposition that I **may** be wrong but to the proposition that I **am** wrong. Under an analysis in which *I may be wrong* has a deep structure like (1b), there is a constituent, namely S_1, that is a semantically appropriate antecedent for the *it* of (1a).

ii. Constituents required as domains for transformations

When a sentence contains a "derived" syntactic constituent, such as a passive V^l, its derivation must involve an application of the transformation that derives such constituent, and the sentence thus requires an underlying structure containing an appropriate constituent to serve as the domain for that application of the transformation. For example, one of the arguments given below for having a transformation of Conjunction-Reduction such as can yield conjoined V^rs when applied to an input having conjoined Ss with identical subjects is the possibility of the conjuncts of a conjoined V^r being passive. Thus, for the passive V^r *was given a reduced sentence by the judge* in (2) to be derived by the passive transformation, there has to be a S of the form *the judge give X a reduced sentence* to serve as domain for the application of Passive:

(2) Bill pleaded guilty and was given a reduced sentence by the judge.

Since the remainder of the deep structure has to provide for *Bill*, *plead guilty*, and *and*, and since the "X" of *the judge give X a reduced sentence* is interpreted as referring to Bill, the way of putting this material together that is consistent with the interpretation of (2) and differs the least from its surface structure is in a structure in which (leaving aside tenses, which will be largely ignored until chapter 8) *Bill plead guilty* and *the judge give Bill a reduced sentence* are conjoined, with *and* as the conjunction.

Passive and the other "subject-changing" transformations that are taken up in chapter 4 will figure prominently in arguments of this type in subsequent chapters (especially chapter 5), since they provide direct evidence for many of the Ss that will be posited in the underlying structures of chapters 5ff: in each case the domain to which the transformation applies will be a S, and the NPs whose status as subject changes (here, *Bill*, which becomes the subject of the S, and *the judge*, which loses the status of subject of that S) have to have the appropriate roles in that S.

iii. Funny NPs

The bulk of this section will be devoted to discussion of what I will refer to informally as "funny NPs", that is, NPs that are restricted to appearing in combination with a limited range of items, as in the case of NPs that are parts of idioms, e.g. *pull my leg* and *let the cat out of the bag*. These two idioms make up V^rs, and when the parts of the idiom are separated from one another, as in (3), an underlying structure in which they combine to make up a V^l must be posited, and concomitantly, a transformation that breaks up the V^r (such as the passive transformation, which separates the object from the rest of the V^r in (3a) as well as in passive clauses that do not involve idioms):[11]

(3) a. The cat has been let out of the bag.

b. Your leg is easy to pull.

Besides idioms that make up V^rs, we will also make use of idioms that make up Ss, such as *The shit hit the fan* and *The cat has X's tongue*; when the NP and V^l making up such an idiom are separated from one another, as in (4), we have grounds for positing an underlying structure in which they

make up a S:

(4) a. The shit seems to have hit the fan.

b. The cat seems to have his tongue.

Two other ~~examples of~~ funny NPs are the "existential *there*" of *There's someone outside* and the "ambient *it*" of *It's raining*.[12] Funny NPs of all kinds are useful in establishing that two parts of a sentence (the funny NP and the material that "supports" it) make up a deep structure unit; this will often provide the basis of an argument that an embedded S of some sort must be posited in the deep structure of a given class of sentences. In each case the argument will allude to a restriction on the use of the funny NP in simple sentences and will maintain that complex sentences in which the funny NP occurs must have underlying structures in which the same restriction holds as in simple sentences. For example, when existential *there* occurs in a simple sentence, it is restricted to the position of the subject of the sentence:[13]

(5) a. There occurred a disaster here.

a'. *A disaster occurred there here.

b. There is nothing wrong with you.

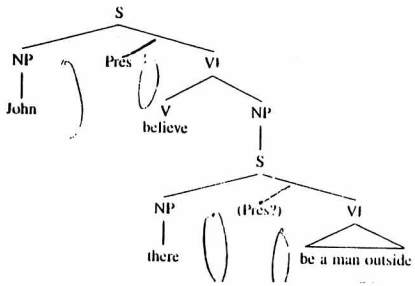
b'. *Nothing is there wrong with you.

b''. *Nothing is wrong with you there.

This observation can be used in arguing that sentences like (6a) have an underlying structure containing an embedded S of the sort that *there* could be the subject of, as in (6b):[14]

(6) a. John believes there to be a man outside

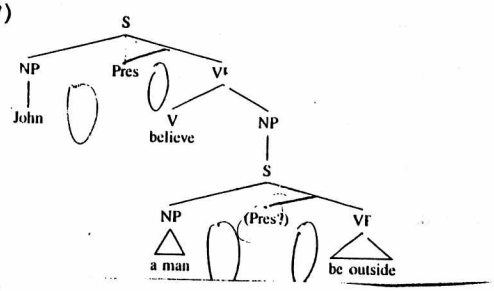
b.



reduced spell

In chapter 4, I will argue that existential *there* is not present in deep structure, and that there is a transformation ("There-insertion") replacing the subject of one kind of existential sentence by *there* and moving the underlying subject into the V' (e.g. *There is a man outside* will have the same deep structure as *A man is outside*). In conjunction with that analysis, the restriction on existential *there* leads to the conclusion not that (6b) is the deep structure of (6a) but rather that it is an intermediate stage in its derivation, the deep structure being instead more like (7):

(7)



Ambient *it* occurs only in combination with a limited set of verbs and predicate adjectives that express "environmental conditions" (especially, but not exclusively, weather):

(8) a. It was raining/snowing/thundering/pouring.

b. It was hot/cold/pleasant/delightful/unbearable/disgusting/uncomfortable in the attic.

c. I like/enjoy/hate it here.

d. It's third down and twelve to go.

e. It's intermission now.

e'. It's 4:00

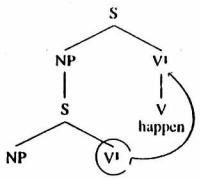
In most instances ambient *it* is the subject of its clause either in surface structure or in what is arguably the deep structure (as in the case of *The lake makes it pleasant here*, which allows an analysis in which the deep structure direct object of *make* is a sentence *It is pleasant here* whose subject is ambient *it*). There are, however, a few clear cases like (8c) in which ambient *it* is not the subject of a clause under any well-supported analysis.[15] In either case, however, there are words that "~~support~~ license" the ambient *it* (*rain, hot*, etc. in the case of an ambient *it* subject, *like*, etc. in the case of an ambient *it* object), and sentences in which ambient *it* and its ~~support~~ licenser are separated from one another can be used as the basis of arguments for deep structures in which they are together and thus for a transformation that separates them. For example, the acceptability of sentences as in (9) provides an argument for an underlying structure in which the NP and V' of *NP happen to VP* comprise a S of deep structure and for a transformation that breaks that S up:

(9) a. It happened to rain/snow on the day of the picnic

b. It happened to be hot/pleasant/delightful on the day of the picnic.

That is, for the sentences in (9) to have deep structures in which *It rain* or *It be hot* occur as constituents, ambient *it* must not be the deep structure subject of *happen* but rather the deep structure subject of *rain* or *(be) hot*, and a movement transformation must detach it from the embedded S of which it is the subject and make it into the derived subject of *happen*

(10)



Details of this derivation will be given in chapter 5.

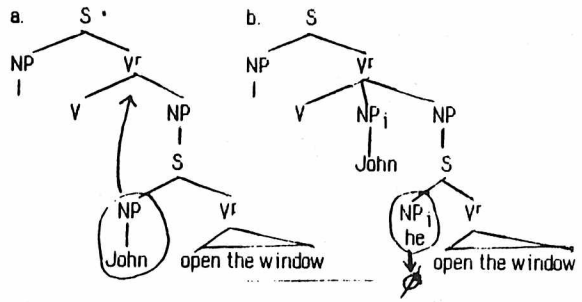
Examples involving funny NPs can bring out distinctions among combinations that are otherwise hard to distinguish. For example, there are two fairly obvious possibilities for the derivations of sentences like those in (11):

(11) I made/had John open the window.

I led/got/caused/prompted John to open the window.

One is to posit a deep structure in which the verb has a S as its direct object (12a) and a transformation ("Raising to object") breaking up the embedded S by moving its subject into the main S, and the other is to posit a deep structure (12b) in which the verb has an object NP in addition to an embedded S and a transformation ("Equi-NP-deletion") deleting the subject of the embedded S if it is identical with the object of the main verb.[16]

(12) a.



b.

We have no grounds to suppose that one of these hypotheses would cover all the examples in

(11), and by looking at examples in which a funny NP follows the verb, we can in fact show that some of the verbs in (11) demand the (12a) analysis and others the (12b) analysis:

(14) a. The witch doctor made it rain by doing a rain dance.

a'. God had it rain on the day that we were going to have the picnic.

b. I got/caused it to rain by praying to St. Polycarp.

(15) *I led/prompted it to rain by praying to St. Polycarp.

These examples provide evidence that *make, have, get,* and *cause* require the [$_V$ V S] deep structure of (12a) while *lead* and *prompt* require the [$_V$ V NP S] deep structure of (12b), with concomitant Equi-NP-deletion. That is, with a deep structure as in (12a), there is nothing to prevent the embedded S from being one whose subject is ambient *it*, in which case the ambient *it* becomes the derived object by Raising-to-object, thus yielding sentences as in (14). However, with a deep structure as in (12b), supplemented with the assumption that *lead* and *prompt* are not included in the small set of verbs (such as *like*) that support ambient *it* as a deep structure object, if the embedded S had ambient *it* as its subject there could not be the application of Equi-NP-deletion that the (12b) analysis requires, since the NP of the main S then could not be identical to the subject of the embedded S, and thus the conditions for Equi-NP-deletion could not be met. We then have an explanation of the unacceptability of the examples in (15).

The same distinction among these verbs can be brought out by examples involving existential *there*:

(16) a. I made/had there be total silence.

I got/caused there to be total silence.

b. *I led/prompted there to be total silence.

The facts involving idiom chunks differ from one idiom to another:

(17) a. *I made/had the cat get out of the bag.

a'. I caused/??got the cat to get out of the bag.

b. *I led/prompted the cat to get out of the bag.

The difference in acceptability of the sentences in (17a-a') brings out a reason why it is

sometimes difficult to assess the implications of data involving funny NPs, namely that the embedded S posited in a given analysis may be subject to additional restrictions beyond the purely syntactic ones that the analysis imposes. For example, while the (12a) analysis does not itself impose any restriction on the embeded S beyond the fairly trivial requirement that it be of [NP VP] form, each of the verbs that participate in the construction has a specific meaning and accordingly imposes semantic restrictions of its own on what the embedded S can denote. Thus, the unacceptability of (17a) does not necessarily imply that *make* is excluded from the (12a) construction; *make* (unlike *cause*) refers to a situation in which the entity denoted by the subject NP brings about something that is "under his control", and *the cat gets out of the bag* refers to a type of event that is conceived of as not being under anyone's control and is thus excluded in (17a) by its semantic incompatibility with the meaning of *make*.[17]

A clear instance in which a verb imposes a semantic constraint on its complement S is illustrated by sentences with the main verb *cease*:

(18) a. *The cat ceased to get out of the bag.

b. John ceased to be angry at me.

b'. John ceased to yell at me.

b". *John ceased to have a fit of anger.

b"'. John ceased to have a fit of anger every time he saw me.

b"". John ceased to have fits of anger.

c. *The bomb ceased to explode at 10:00.

c'. The bombs ceased to explode at 10:00.

d. There ceased to be any reason to remain here.

d'. It ceased to be pleasant here.

To determine whether the NP and V^1 of *NP cease to* V^r make up an underlying S, one should look at examples in which the NP is "funny" and the V^r contains material that normally ~~suppresses~~ licenses that NP. While (18a) is such an example, its unacceptability does not in this case provide an argument that the NP and V^r do not make up an underlying S. The acceptable sentences in (18) are those in which the embedded S can be interpreted as denoting a state. For example, (18b') refers not to an event of yelling but to the state describable as *John yells at me*: (18b') means that it is no longer the case that John (regularly) yells at me. The contrast between (18b") and (18b"'-b"") is between an embedded S referring to a single fit of anger (unacceptable) and one referring to regularly repeated fits of anger (acceptable); in (18c-c'), the contrast is between an embedded S referring to a single explosion (unacceptable) and one referring to a state in which repeated explosion occur (acceptable).[18] *The cat gets out of the bag* violates the semantic requirement that the complement of *cease* denote a state rather than an event. The examples in (18d-d') involve funny NPs in complement Ss that denote a state rather than an an event, and their acceptability establishes that the NP and V^1 of *NP cease to* V^r do make up an underlying S.

EXERCISES

1. What do the possibilities for V^r-deletion tell you about the constituent structure of the following examples?

a. John gave a book to Mary.

b. John washed the dishes for Mary.

c. Ann filled the pool with a hose.

d. Ann filled the pool with water.

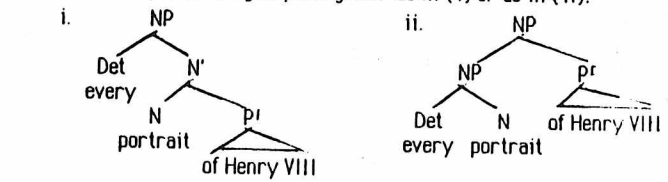
e. Sam hammered the metal flat.

f. Sam gave a lecture drunk.

2. Determine whether facts about conjoining confirm the conclusions you reached in exercise 1.

3. If the sorts of P^1 in exercises 1a-b or those in exercises 1c-d are combined in a single clause, does it matter what order they come in? Does your answer have any bearing on the question of how these P^1s fit into the constituent structure?

4. a. Using examples with coordinated constituents, test whether the parts of a NP such as *every portrait of Henry VIII* are grouped together as in (i) or as in (ii):



Treat the symbol N' (which will be introduced more formally in chapter 7) as simply meaning

something that consists of a noun plus adjuncts and/or modifiers that it may have.

b. Assuming the answer that you have arrived at for part (a), use examples with coordinated constituents to test how restrictive relative clauses fit into the surface constituent structure of NPs such as *every portrait of Henry VIII that Holbein painted*.

5. Use examples containing "funny NPs" to choose between an underlying structure like §3c(9a) and one like §3c(9b) for sentences involving the underlined verbs:

a. Mary <u>let</u> John sell the car.

b. Bill <u>had</u> the tailor lengthen the sleeves.

c. George couldn't <u>induce</u> Mary to go to the concert with him.

d. The robbers <u>compelled</u> John to give them the money.

e. Mary <u>prevented</u> John from selling the car.

6. Apply the tests of §3b to determine whether each of the following examples contains a verb-particle construction or a verb plus a prepositional phrase. Do not overlook the possibility that a particular example might be both, i.e. that it is ambiguous between an interpretation corresponding to the one structure and an interpretation corresponding to the other:

a. John <u>took off</u> his shoes.

b. Libya <u>borders on</u> Egypt.

c. We <u>looked at</u> the announcement.

d. They <u>looked over</u> the table.

e. I <u>threw out</u> the garbage.

f. We were <u>working on</u> the furnace.

g. Amalgamated Frammis has <u>taken over</u> Consolidated Implements.

7. Make up examples to show that verb-particle constructions differ from V P^r combinations with regard to each of the following:

a. The possibility of putting the particle or preposition **after** the NP (e.g. *John picked the money up*).

b. The possibility of having the NP position filled by a pronoun (e.g. *He ran up it*).

c. The possibility of putting an adverb between the verb and the particle or preposition (e.g. *John ran frantically up the stairs*).

8. Use all applicable tests to determine whether the underlined expressions in the following examples are constituents:

He spent <u>day after day</u> in his laboratory.

<u>One candidate after another</u> withdrew from the race.

9. Under certain conditions, repeated predicate NPs, A's, and P^rs can be deleted:

Ted is <u>a friend of my father's</u>, and Sam is Ø too.

Ted is <u>afraid of snakes</u>, and Sam is Ø too.

Agnes is <u>in the library</u>, and Janet is Ø too.

Determine whether these deletions share the characteristics of V^r-deletion that have been noted here. (Your answer will provide a basis for saying whether these deletions should be subsumed under the (perhaps misleadingly named) transformation of "V^r-deletion".)

NOTES

1. I ignore here the possibility that e.g. some transformation applying with the whole composite S as domain might alter the constituent structures of the component sentences in parallel ways. The only possible example of such a transformation that I know of is one that will be considered in §20■ in connection with sentences such as *Mary took more photos of animals than John did of old houses*, in which contrasting elements are extracted from otherwise parallel V's.

2. Note that CR is described here as not being a deletion (like Stripping or Gapping) but rather a factoring out of shared structure. In §9■, evidence will be given that this description is correct: that when applied to conjoined Ss, Gapping and Stripping yield conjoined Ss with incomplete conjuncts, while CR yields a non-conjoined S that contains a conjoined part.

3. For the surface constituent structure of sentences involving RNR, see chapter 16. In this passage I have deviated from my usual practise of illustrating the outputs of the various transformations, because in this case the derived constituent structure is of a different type from the structures considered so far in the book, and I prefer postponing discussion of structures of that type until later in the book.

4. There is in fact considerable individual variation on this point, with examples like (12), in

which Gapping leaves a three-part rather than a two-part residue, being acceptable for many speakers; see in this connection Abbott 1976 and Grosu 1976. Gapping provides a useful test of constituent structure only with regard to the idiolects of speakers for whom the restriction to a two-part residue is in force.

5. S_1 is treated here as occupying the underlying **subject** position of S_0, since that is the position in which its surface counterpart in the pseudo-cleft appears, and the position occupied by its surface counterpart in the pseudo-cleft is one to which a sentential subject could be moved by **Extraposition**, as in *It's obvious that John was talking to Alice*.

6. Cleft sentence$_S$ with a focused A^f such as (23e) are completely acceptable in Irish English; cleft sentences are unusually common in Irish English and are exempt from some restrictions that apply to them in other varieties of English.

7. This constraint will be discussed in detail in §10c, where attention will be paid to how exactly "S" and "in the middle of" must be understood. For example, the constraint must exclude *that*-clauses and infinitives but not expressions such as *(John's) insulting Mary* in the middles of clauses:

It was John's insulting Mary that annoyed Roger the most.

8. The conclusion reached here about what *deeply* and *intentionally* modify is confirmed by the fact that the *intentionally deeply V* is acceptable but *deeply intentionally V* is not:

John intentionally deeply offended Mary.

*John deeply intentionally offended Mary.

Intentionally can modify any V^f with an appropriate meaning (i.e. any V^f that denotes an act), irrespective of whether the V of that V^f bears a modifier.

9. Actually, to a limited extent, *only* or *even* can follow its focus:

John owns three shirts only.

Alice likes snake meat even.

Such examples, which are discussed in some detail in Ross and Cooper 1979, will be ignored below.

10. The placement of *only* and other focus markers conforms to the rationale for tests for shallow structure, in that it involves a cyclic transformation moving *only*, etc. to a position as adjunct of a constituent containing the focus; however, the details of that transformation, whose input is in fact quite different from the structures given so far, will not be given until chapter 18.

11. For criticism of the use of idiom chunks as a test for deep constituent structure, see Nunberg, Sag, and Wasow (1994) and Ruwet (1991).

12. Existential *there* is in fact a NP only with regard to its "external syntax", i.e. it fills an "argument position". The status of existential *there* as a NP and of the category NP in general will be discussed in detail in chapter 7.

13. *There* in all the examples in (1) is to be interpreted as existential *there*, not as the locative *there* (meaning "(at/in) that place") of such sentences as *A disaster occurred there*.

14. The parenthesized "Pres" in the embedded S of (2b) reflects unclarity as to whether that S should indeed have a tense marker. I will eventually argue (§8b) that some nonfinite Ss have underlying tenses and others do not, and that the infinitival complement of *believe* does have an underlying tense (here, Pres).

15. I owe this and many other observations about ambient *it* to Bolinger 1977. For extensive discussion of cases in which ambient *it* and other "expletive NPs" occur in object position, see Postal and Pullum 1988.

16. We are in no position to say that these are the only possibilities. I restrict attention here to those possibilities mainly to facilitate the exposition.

17. Likewise, the possibility of combining causative *have* with ambient *it* is restricted by the meaning of causative *have*, which refers to someone making things be a certain way just by deciding that they should be that way. The subject need not be divine, e.g. one can say to a script-writer, "You should have it rain in the next scene".

18. Actually, (14c') has two possible interpretations, both of which fit this description. In one interpretation *at 10:00* modifies the main clause and the sentence means that explosions had been going on until 10:00 but no more occurred after 10:00. In the other interpretation it modifies the subordinate clause, and the sentence means that there used to be an explosion at 10:00 every night but that that ceased to be the case (say, the bombers changed their schedule so that the bombs now went off at 9:30 instead of at 10:00).

b. A reappraisal of the categories proposed so far

Let us now re-examine the putative syntactic categories that figure in chapters 1-6 (as well as some others that figure in influential syntactic literature) in light of the conception of syntactic category adopted in the preceding section.

S. The category "S" is, like NP, the fuzzy syntactic category corresponding to a logical category, though to say what that category is, it is necessary to be careful about some important distinctions that usually get blurred. It is not quite correct to say, as I did in the first edition of this book, that S is the syntactic counterpart of the logical category "proposition", since only some of the constituents that are commonly labeled S denote propositions, while others denote events, situation classes, facts, and perhaps other types of entities. Moreover, it is now essential for us to distinguish between the two constituents that have been labeled S in structures of the form [$_S$ Comp S] in chapters 5-6; for example, while *for John to get a job* denotes a situation class, it is not clear whether *John get a job* as a deep structure constituent of that *for-to* complement likewise denotes a situation class or instead an entity of some other type. I propose that the "inner S" of the [$_S$ Comp S] structure denotes a **propositional nexus**, in the sense of something that yields a proposition when all of its "indices" are specified, i.e. when one provides values for various parameters that the [NP V'] combination itself may leave unspecified: a time, a spatial location, a world (the real world, or one of the infinitely diverse hypothetical and fictional worlds that figure in the interpretation of sentences), etc. The "outer S" of the [$_S$ Comp S] structure, by contrast, denotes a proposition, or a situation class, or whatever, and the Comp can tentatively be held to denote an "operator" that combines with a propositional nexus to yield such an entity. The only respect in which traditional terminology draws any distinction between the inner and outer Ss of the [$_S$ Comp S] structure is that the word "clause" is more commonly applied to the outer rather than the inner S. I will accordingly reserve the term "sentence" (and the label S) for constituents corresponding to a propositional nexus (thus, the "inner S" of such a structure, as well as sentential nexuses that are used without any Comp); later in this section I will raise the question of what would be an appropriate label for the "outer S".

The internal structure most typical of constituents that denote propositional nexuses is [NP V'].[12] The periphery of the category includes items that denote propositional nexuses but have a different internal syntax; this takes in items as in (1a-a"), which exhibit a reduced form of [NP V']; as in (1b), in which the subjects of both Ss are preceded by items of types that normally cannot precede the subject;[13] as in (1c), in which a partially idiosyncratic form as in (1b) is reduced; and as in (1d), in which a S has essentially no internal structure:

(1) a. John wants <u>to go home</u>.

a'. John wants <u>a new apartment by the end of the year</u>.

a". With <u>the bus drivers on strike</u>, we'll have to form a car pool.

b. <u>The longer John has to wait</u>, <u>the angrier he gets</u>.

c. The more outrageous a politician's promises, the bigger his margin of victory.

d. John made nasty remarks about Mary, and <u>vice versa</u>.

Reduced Ss differ in the degrees to which they are reduced, and thus should be regarded as being Ss in internal syntax to varying degrees.

Prepositional Phrase. It is not obvious what (if anything) should count as the head of a unit that consists of a P and a NP. If the P is the head, what are commonly called "prepositional phrases" are preposition phrases, and we can identify "prepositional phrase" with P', as we in fact have already been doing. However, we must guard against drawing such an inference through an equivocation over the term "object". What is normally called the "object" of a preposition is often its object in the sense of §7a, e.g. *in* in *George Washington was born in 1732* expresses a two-place relation between an event and a time, and *1732* indicates the time that fills the second place. However, since *of* in *the destruction of Carthage* does not express a predicate, *Carthage* does not have **that** object relation to *of*. I will in fact categorize as P' even expressions such as *of Carthage*, but I emphasize that that policy is justified only if we can maintain (as I will, at least tentatively) that semantically empty instances of a part of speech take on the same syntactic relations as do semantically contentful members of the category.

I will in addition (following Jespersen (1924:89)) treat so-called "subordinating conjunctions", as in (2), as prepositions with sentential objects, and will consequently take expressions such as *before he left* to be P's:

(2) a. John phoned me before he left.

b. Sam worked at a second job until he had paid off his debts.

c. I'll help you if you'll tell me what the problem is.

d. Although Debbie likes Ed, she is very inconsiderate of him.

e. While you're making the coffee, I'll set the table.

Jespersen's principal argument for this conclusion was that many "subordinating conjunctions" are homophonous with and synonymous with prepositions as normally understood, as illustrated by the following parallels to (2a-b):

(3) a. John phoned me before his departure.

a'. John phoned me before the football game.

b. Sam worked at a second job until his arrest.

b'. Sam worked at a second job until the summer.

To that observation, we can add that those "subordinating conjunctions" that are not homophonous with ordinary Ps (2c-e) could be paraphrased by ordinary Ps if the "object" were expressed by an ordinary NP rather than by a S, e.g. *while you were singing* can be paraphrased by *during your singing*, and *while* in the one expression makes the same contribution to the meaning that *during* does in the other. A second argument for identifying "subordinating conjunctions" as Ps with S objects is that the phrasal units that they head have the same external syntax as ordinary P's, i.e. they occur as left- or right-adjuncts to Ss, as right-adjuncts (but only marginally as left-adjuncts) to V's, and as right adjuncts to N's:

(4) a. Before the football game, John looked sad.

a'. Before he left for London, John looked sad.

b. ??John before the football game looked sad.

b'. ??John before he left for London looked sad.

c. The outcome under those circumstances is unpredictable.

c'. The outcome if John refuses our offer is unpredictable.

Under this view, Ps are subcategorized with regard to the syntactic form that they allow for their object, e.g. *at* requires an object that is a NP in internal syntax, *if* requires a finite S, *before*

allows either a NP or a finite S, and *with* allows either a NP or a nonfinite S.

"Aux".[14] The category name "Aux", which is not used in this book, has figured widely in analyses of English auxiliary verbs; its meaning varies considerably from one author to another. In Chomsky (1957, 1965), it designated the whole sequence of auxiliary verbs that occurs in a given S, e.g. *must have been* was an Aux. In the works of many subsequent authors (e.g. Akmajian et al. 1979), however, it has been used to mean "tensed auxiliary verb", so that *must have been* would not be an Aux but the *must* of that combination would be one. It will be argued in chapter 8 that the constituent structure assumed in Chomsky's analysis is incorrect (and the problem of categorizing the (nonexistent) constituent that that analysis posits thus vanishes), and that auxiliary verbs (whether tensed or tenseless) are verbs and each is the head of its own V' except insofar as it has been removed from that V' by Inversion.

Adverb. Traditional definitions of "adverb" all amount to "modifier other than adjective." They thus make it a wastebasket for modifiers. At least, though, the traditional definitions point to a factor that can serve as a basis for classification of modifiers if it is used systematically rather than in the haphazard way in which it has figured in traditional schemes of parts of speech, namely, the category of what is modified. (Adjectives modify nouns and NPs; "adverbs" modify everything else.) The various items that have been classed as adverbs in fact differ among themselves with regard to what they can modify and, correspondingly, in the surface positions that they can occupy:

(4) a. *Completely the invaders were destroying the fort.
a′. *The invaders completely were destroying the fort.
a″. The invaders were completely destroying the fort.
a‴. The invaders were destroying the fort completely.
b. ?Intentionally John was insulting Mary.
b′. John intentionally was insulting Mary.
b″. John was intentionally insulting Mary.
b‴. John was insulting Mary intentionally.
c. Probably a war will break out.
c′. A war probably will break out.
c″. A war will probably break out.
c‴. *A war will break out probably.

Here *completely* modifies a V, *intentionally* a $\bar{V}$, and *probably* a S. It thus may be appropriate to introduce terminology that expresses distinctions with regard to the category of what is modified, e.g., we may wish to apply terms such as "Ad-V," "Ad-$\bar{V}$," and "Ad-S" respectively to the three "adverbs." Such categories figure prominently in the tradition of **categorial grammar** (e.g., Ajdukiewicz 1935), the first syntactic approach in which a policy was adopted of classifying modifiers systematically on the basis of the category of what they modify.

The last paragraph has dealt with notions of adverb that relate to syntactic functions. However, the question of what adverbial syntactic functions must be recognized is independent of the question of whether a lexical category corresponding to the traditional term "adverb" must be posited. Note in this connection that the lexical category "adjective" is not restricted to items that are functioning as modifiers of Ns, $\bar{N}$s, or NPs, as in (5a)—it also takes in predicative uses as in (5b), where *happy* strictly speaking does not modify anything:

(5) a. I've written a poem about a happy man.
b. John is happy.

In chapter 8 we will make use of the proposition that morphology provides a prima facie case for membership in a part of speech, e.g. *have* (whether it is used as an auxiliary verb or as a main verb) is inflected like a verb, and for that reason it belongs to the category V. Since adverbs in English have no inflectional morphology, we cannot assign items to a putative part of speech "Adverb" on the basis of how they are inflected. There is, however, one detail of morphology that provides some support for the recognition of such a part of speech, namely the fact that the suffix *-ly* is common among adverbs of several of the classes that differ with regard to what they modify (as in (5), where all three adverbs have the suffix *-ly*).

Let us in fact tentatively accept **both** a part of speech "Adverb" **and** a set of notions "ad-X" that distinguish modifiers with regard to what they modify, being careful, of course, not to confuse the part of speech Adverb with the category Ad-V. If there is a part of speech Adv(erb), is there also a corresponding phrasal category Adv' consisting of phrasal units having an Adv as head?[16] Adverbs can be combined with degree expressions, as in (7):

(7) a. extremely quickly
b. quite disgustingly

However, since the degree expressions are modifiers of and not "objects" of the adverbs, these expressions provide no grounds for recognizing a category Adv': a modifier combines with an item into an expression of the same category as that item, and thus *extremely quickly* cannot be classed as an Adv' unless *quickly* itself can be so classed. Jackendoff (1977:78) has observed that while adverbs usually do not admit objects, even if they are close counterparts of adjectives or verbs that do admit objects (8a–b), there are a small range of adverbs that do admit objects (8c–d):

(8) a. fearfully (*of snakes)
b. angrily (*at Bill)
c. fortunately/unfortunately/luckily for us
d. subsequently to his arrival

I accordingly tentatively recognize a phrasal category Adv', though I note that it will often be difficult to determine whether a particular occurrence of an Adv instantiates it, since not all positions that admit Advs will admit the relatively few Advs that can take an object and thus allow

the position to be identified unambiguously as filled by an Adv'.

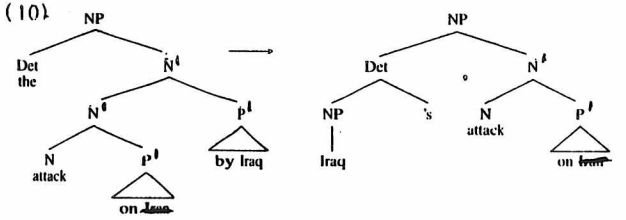
Det. Det is the syntactic counterpart of the logical category of **quantifier**. A quantifier is an element of logical structure that specifies for how much or for which part of a domain a propositional function is true (in *Some politicians are honest*, the quantifier *some* indicates that "x is honest" is true of a non-empty part of the domain defined by "politician"; the domain is normally defined, as it is here, by an N'). Like S and NP, Det is a fuzzy category with dimensions corresponding to semantics, internal syntax, and external syntax. Prototypic quantifiers combine with an N' into a constituent having the external syntax of a NP. There is little of interest in the internal syntax of Dets: leaving aside possessives, which will be taken up shortly, the items that are Dets with regard to either semantics or external syntax are usually single words (*all, every, some, most, a, this, that, ...*),[17] in some cases accompanied by modifiers (*almost all, all but two*). The possible combinations of values for the other dimensions of category membership can be illustrated as follows:

(9)

	Semantic	Ext-syntactic	By inheritance
All pastry is fattening.	+	+	+
The boys have all gone home.	+	-	-
Iraq's attack on Kuwait.	-	+	+
Sophie is a lawyer.	-	+	-

The entry for */raq's attack on Kuwait* assumes an analysis in which it is derived from a structure that also underlies *the attack on Kuwait by Iraq* by a step in which */raq*, converted into its possessive form, replaces *the*:[18]

(10)



Kuwait/ 2x

The semantically empty articles that appear on predicate NPs (11) likewise do not have the semantic role that defines the category Det but do occur in a position typical of items with that

semantic role:

(11) a. Sophie is a lawyer.

b. Scott is the author of *Waverley*.

Conj. Conj corresponds to the category of those logical "operators" that specify how many of a set of propositions are true (e.g. *and* specifies that all of the propositions in a given list are true).[19] The core of this category consists of those words whose contribution to the meaning of a S is nothing more than that all, some, or none of the propositions with which it is combined are true. The periphery includes *but* (which says not just that both of the propositions with which it is combined are true but that the second one is noteworthy against the background of the first) and the diverse expressions such as *as well as* and *besides* (to be taken up in S9c) that have taken on the role of coordinating conjunctions through reanalysis of constructions that involved subordination.

Complementizer. Whether Comp can be identified as the syntactic counterpart of a logical category depends on how one works out the contribution of complementizers to logical structure, a question to which logicians have devoted virtually no attention. Different types of complements can denote different types of entities, e.g. in (12a), the complement denotes a proposition, in (12b) it denotes a "situation class" (cf. Barwise and Perry 1983), in (12c) it denotes an event, and in (12d) it denotes a "fact":

(12) a. Mary told me that Bill had left. •cite Bhatt and Yoon WCCFL 10•

b. For Bill to leave now would be disastrous.

c. I heard the glass break.

d. I'm shocked at Bill leaving.

Suppose that we in fact assume that entities of these four types (and probably others) must be recognized in logical structures and that a Comp denotes an "operator" that combines with a propositional nexus to yield an entity of the type in question. Then Comp can be treated as the syntactic counterpart of the logical category that takes in such operators, and it will be a fuzzy category having semantic, internal syntactic, and external syntactic dimensions. Many languages have a syntactic position (in English, the position as left sister of an embedded S) that

complementizers occupy unless morphology requires them to be elsewhere. An expression that occupies this "Comp position" is then a Comp on the dimension of external syntax; an item that denotes an operator of the above type will be a Comp on the semantic dimension even if it does not occupy that position, as in the case of *-ing* in (12c). Under the analyses of relative clauses and interrogative clauses that will be presented in chapters 13-14, in which the relative or interrogative expression is moved into the Comp position of the relative or interrogative clause, the moved expression is then a Comp on the dimension of external syntax but not that of semantics.

In some languages, certain Comps belong to specific parts of speech. For example, in Japanese, the Comp *koto* (likewise, *no* and *yoo*) is a N and the Comp *to* is a P. The combination of S and *koto* has the superficial appearance of a relative clause construction, and takes whatever P is appropriate to its role in its host S, e.g. a direct object *koto* complement will be followed by the accusative postposition *o*, just like an ordinary direct object. By contrast, *to*, which is used mainly to mark complements of verbs of saying or thinking, is not followed by a postposition such as *o*, even though the *to* complement may amount to a direct object of the higher V.

Having tentatively concluded that a combination of a Comp with a nexus is of a different semantic type from that of the nexus itself, we should reexamine our practise so far of using the label "S" for both of those units. There are a number of syntactic approaches in which those units are treated as belonging to different categories, with the nexus labeled S and the combination of Comp and nexus labeled something else, one popular label being S'. The symbol S' is an unfortunate choice, since the ' in that combination then cannot be given its normal interpretation, in which it means "phrasal unit" and is combined with a symbol for the part of speech of the head of that unit. S is not a part of speech, and the role of the S in the putative S' appears to share nothing with the role of a V in the V' that it heads. A more defensible category label is Comp', which would take the Comp to be the head of the unit, which at least makes the head commonly a word and is plausible since the restrictions that predicates commonly impose on the form of their sentential complements would then be a restriction on the head of the complement.

There are cases where a distinction between S with Comp and S without Comp must be drawn. For example, a distinction must be drawn between sentential complements that are objects of Ps,

where the P is deleted and a complementizer appears in surface structure (13a), and Ss combined with Ps in adverbial constructions, where the P is retained and no complementizer appears (13b):

(13) a. Bill is anxious (for->Ø) that you get home safely.

b. I left before (*that) Joan arrived.

This distinction can at least be drawn neatly in terms of a class of cases where a P has a Comp' object (13a) and one where it has a S object (13b). The question, however, is whether there is reason to take that to be the distinction rather than, say, to make the relevant rules sensitive to presence vs. absence of a complementizer, or to the difference between a complement (as in (13a)) and an adjunct (as in (13b)) instead of to the putative distinction between S and Comp'. Since it is far from clear whether the role of the Comp in a Comp + S combination is that of the head of a phrasal unit (as is assumed by the label Comp') or is that of a modifier (as would correspond to the practise of chapters 1-6, in which the combination has been labeled S), I will take no firm stand on the issue of the appropriate label and will continue labeling such combinations S largely from force of habit. •Extraposed complements are Ss with regard to $external_S$ but not $external_d$ syntax: they are in a position that is typical for surface constituents representing propositions, but not one that is filled in deep structure by a constituent that represents a proposition. •

relation of a Comp to the S with which it is combined has nothing in common with the relation of object NPs and $\bar{P}$s to the V with which they combine into a $\bar{V}$. The only halfway plausible parallelism between "$\bar{S}$" and "bar" categories is that in which the Comp is regarded as the head and the S as its object, in which case not $\bar{S}$ but $\overline{Comp}$ would be the appropriate name.[16] Rather than pervert the use of the bar by employment of the symbol $\bar{S}$, I will provisionally simply take presence vs. absence of a complementizer to be an additional factor to which syntactic rules can be sensitive, and in cases where that factor plays a role I will simply introduce symbols ad hoc to distinguish between categories that will otherwise be lumped together under the symbol "S."

It may be useful to conclude this section by pointing out some differences between the conception of syntactic categories adopted in this book and the conceptions generally adopted in transformational grammar. Transformational grammarians generally take syntactic categories as provided by "base rules," which specify how elements may combine in deep structure. Under that policy, two items belong to the same syntactic category if and only if they combine in the same way with other items in deep structure, and an item in surface structure (or in any intermediate stage of the derivation) belongs to some category if and only if its counterpart in deep structure belongs to that category. That policy implies that a constituent cannot change category in the course of a derivation, and that items introduced in the course of a derivation belong to no category at all (because an item has to have a deep structure counterpart if it is to have a category).

By contrast, the conception of category advanced in this chapter has no special connection with the notions of "base rules" (= deep structure combinatoric rules) or of "deep structure," does not preclude change of category in the course of a derivation, and treats transformationally inserted items on a par with any other items in the application of category notions. For example, under the approach advanced here, anything consisting of a preposition and a NP is a $\bar{P}$, regardless of whether the preposition is present as such in deep structure, is inserted in the course of a derivation, or replaces an item of a different lexical category.

No examples of this last possibility have been given so far, but one can easily be given. The extended sense of possession that is expressed by *have* can also be expressed by *with* in a postnominal modifier:

(12) a. a man who has a scar on his face
a'. a man with a scar on his face
b. a plan which has no prospects for success
b'. a plan with no prospects for success

7.20

c. several persons who have serious problems
c'. several persons with serious problems

The expressions introduced by *with* appear in positions that can be occupied by reduced relative clauses (e.g., *a person (who is) under the influence of drugs*) but are not derivable from relative clauses simply through deletion of relative pronoun and *be*, since the expressions with *with* cannot occur as predicate $\bar{P}$s:

(13) a. *John is with a scar on his face.
b. *The MX missile project is with no prospects for success.
c. *Your neighbors are with serious problems.

However, they can be treated as reduced relative clauses if *with* is taken as optionally replacing *having* in reduced relative clauses, e.g., (12a') would be derived from *a man having a scar on his face* (a reduced form of (12a)) by replacement of *having* by *with*.[17] Under the policies of this chapter (and the remainder of this book), this step would change the category of the expression from $\bar{V}$ to $\bar{P}$, since the lexical category of the head changes (*have* is a V, *with* a P) and the other factors remain constant (the replacement does not change the status of the constituent as "phrasal"), and syntactic category names are only informal abbreviations for combinations of syntactically relevant factors.

4/
4/
20
V

As was noted above with regard to 'Comp', words can belong to a part of speech in addition to belonging to a 'functional' category such as Comp. It will be argued in S12a that words like *many, several*, and the numerals are not Dets but rather As modifying an N'. The restrictions on the position of those words in relation to other As will be a consequence of their semantics: they express properties of a set (such as that the number of its members is large) rather than properties of the individuals that make up the set. By giving such a semantic characterization of *many, several*, etc., one implicitly defines a functional category that contains them. However, that functional category contains Ns such as *lot/lots* as well as As such as *many*, and the syntax of the different members of this functional category reflects their part of speech, in that *lot/lots* requires that the N' with which it is combined be marked with a P, and *lot* requires an article and can itself by modified by an A:

(16) a. a lot of/*Ø books

a'. lots of/*Ø books

a". many (*of) books

b. *lot of books

b'. *a many books

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c. a whole lot of books

c'. *a whole many books

These differences in part of speech are relevant to where these words can appear in surface structure but not to their possibilities for what they can combine with in deep structure.

Under the approach of this chapter, there is no need to suppose that all syntactic categories that figure in the surface structures of a language also figure in its deep structures. For example, it allows for the possibility of a language in which there are P's in surface structure but not in deep structure, all Ps being inserted as adjuncts to NPs in the course of derivations. Under the policies of orthodox transformational grammar, all categories that appear in surface structure must also appear in deep structure.

In addition, our policy allows for constituents that are unspecified for one or other of the syntactic factors, e.g. constituents whose heads belong to no part of speech at all. We have in fact already recognized phrasal units whose heads have no part of speech, namely those whose head is a tense marker, and have labeled such units 0', using the makeshift of a zero to indicate absence of part of speech. Another novel possibility that this conception of syntactic category makes available is that of a word belonging simultaneously to two different parts of speech; in §22b it will be argued that there are phenomena which require analyses of that type, e.g. *blue* in *a pale blue shirt* is simultaneously an A and a N.

•pronoun and article?•

8. Auxiliary verbs

a. Possible sequences of auxiliary verbs

We are now in a position to deal in detail with English auxiliary verbs, which I have postponed a serious discussion of until this chapter, since the analysis to be developed here leans heavily on ideas presented in chapterss 5-7.

English allows up to four auxiliary verbs in a clause:[1]

(1) a. Fred plays tennis every day.

b. I may spend my vacation in Jamaica.

It has rained every day for the last week.

The workers are demanding higher pay.

Alice's car was stolen recently.

c. Tom must have arrived by now.

My book has been selling well

The house is being remodeled.

d. Nietzsche may have been influenced by Abelard.

Politicians have been being assassinated for years.

e. George must have been being interrogated by the police at that very moment.

Each auxiliary verb requires that the immediately following verb (whether auxiliary or main) be in a particular morphological form. **Modal** auxiliary verbs such as *may, must, will*, and *should* require that the following verb be in the bare infinitive form (2a) (aside from *ought*, which requires an infinitive with *to*), *have* and passive *be* that it be in the past participle form (2b,c), and progressive *be* that it be in the present participle (*-ing*) form (2d):

(2) a. Ann may spend/*spending/*spends/*spent her vacation in Jamaica.

b. It has rained/*raining/*rains/*rain every day for the last week.

Oscar has been/*being/*is/*was/*be drinking again.

c. Gilyak is spoken/*speaking/*speak/*speaks/*spoke in Sakhalin.

d. The roof is leaking/*leaked/*leaks/*leak.

Accordingly, from now on, only examples in which the morphological demands of the various

auxiliary verbs are met will be given. Inflection for tense is borne by the first verb, whether that is a main or an auxiliary verb.

Only a limited range of combinations of auxiliary verbs is allowed. As a first approximation, we can say that multiple auxiliary verbs must be in the order (Modal)(*have*)(*be*$_{Prog}$)(*be*$_{Passive}$), with no more than one modal, one auxiliary *have*, one progressive *be*, and one passive *be* per clause:[2]

(3) a. *Americans have musted pay income tax ever since 1913. (cf. ... have had to...)

*Moisei Avramovich is maying emigrate to Israel. (cf. ... is being allowed to ...)

b. *George is having lived in Toledo for 30 years.

*The students are had notified of the increase in tuition fees.

c. *The house is been remodeling.

d. *George may must quit his job. (cf. ... may have to ...)

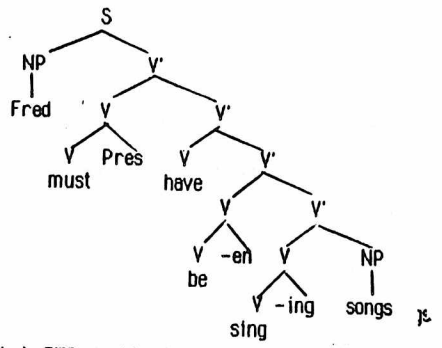
*Margaret has had already left.

*The birds are being singing.

*A medal was been given by the mayor by the sewer commissioner. (as passive of *The sewer commissioner was given a medal by the mayor*).

Given that the various auxiliary verbs are verbs in virtue of their being inflected like verbs (albeit with a highly defective paradigm, in the case of modal auxiliaries), the most obvious way for them to fit into constituent structure is as the head of a V', so that sentences with multiple auxiliaries would have a surface structure as in (4), with nested V's:[3]

(4)



There is in fact considerable evidence that the surface constituent structure of sentences with

multiple auxiliaries is as in (4). The various constituents posited in (4) are possible loci of conjoining:

(5) a. Fred both [must have been singing songs] and [probably was drinking beer].

b. Fred must both [have been singing songs] and [have been drinking beer].

c. Fred must have both [been singing songs] and [been drinking beer].

d. Fred must have been both [singing songs] and [drinking beer].

The possibilities for V'-deletion (as VP-deletion will henceforth be known, in accordance with the revised nomenclature adopted in chapter 7) argue that *been singing songs* and *have been singing songs* are not only constituents but indeed V's, as well as that *singing songs* remains a V' when combined with auxiliary verbs, though it yields no information about *must have been singing songs*:

(6) a. Fred must have been singing songs, and Nancy must Ø too.

b. Fred must have been singing songs, and Nancy must have Ø too.

c. Fred must have been singing songs, and Nancy must have been Ø too.

Since V'-deletion never deletes a tense-bearing auxiliary verb, it is not possible to use it to determine whether *must have been singing songs* is also a constituent. While a repetition of *must have been singing songs* can in fact be deleted (7a), it is not V'-deletion that deletes it but rather the quite different process of ellipsis ("Stripping") that deletes all but one constituent of a second conjunct, as in (7b-b'):

(7) a. Fred must have been singing songs, and George too.

b. Tom gives candy to his girl friend, and flowers too.

b'. Alice talks about baseball with Fred, but not about politics.

Stripping but not V'-deletion is restricted to coordinate structures, and where the clause with the ellipsis is not coordinated with the antecedent clause (and thus only V'-deletion would be applicable), the reduced form found in (7a) is not possible:

(8) a. That Fred was singing songs suggests that George was Ø too.

a'. *That Fred was singing songs suggests that George too.

b. Since Tom gave candy to his girl friend, George did Ø too.

b'. *Since Tom gave candy to his girl friend, not flowers.

In nonrestrictive relative clauses, it is possible to replace a V' with a relative pronoun, and here too the various nonfinite V's of (4) behave like constituents, though this too yields no information about the topmost (finite) V', since nonrestrictive clauses have to have a tense and thus the tensed auxiliary V cannot be part of the constituent that underlies the relative pronoun:

(9) a. They say that Fred must have been singing songs, which he must have been.

b. They say that Fred must have been singing songs, which he must have.

c. They say that Fred must have been singing songs, which he must.

I accordingly tentatively accept (4) (rather than, say, the "flat" structure of the analysis alluded to in note 3) as the surface constituent structure of sentences in which the subject NP is followed by one or more auxiliary verbs.

In (4), there are three occurrences of the by now familiar [V' V V'] configuration, which appears in the outputs both of Raising-to-subject (e.g. in *Fred seems to sing songs*) and of subject-controlled Equi (e.g. in *Fred wants to sing a song*). An obvious question to ask, then, is whether the various V's headed by auxiliary Vs are themselves derived through either Raising-to-subject or Subject-controlled Equi. All the various auxiliary Vs allow a "funny NP" subject that is ~~supported~~ licensed by material in the dependent V':[4]

(10) a. It must be very cold outside.

b. There won't be any problems.

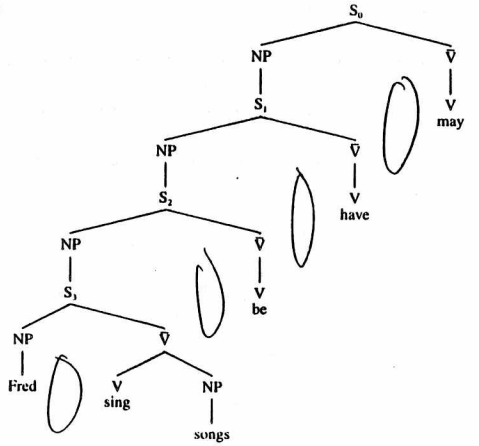
c. The cat may have gotten out of the bag by now.

d. There were senators demanding the president's resignation.

We can thus rule out the possibility that they are Equi verbs and turn our attention to the possibility that they are underlying one-place verbs with a sentential subject that trigger an application of Raising-to-Subject. To see what derivations this would allow for, let us look at that for *Fred ~~must~~ may have been singing songs*, ignoring for the moment the tense, *-en*, and *-ing*. The deep structure is as in (11):

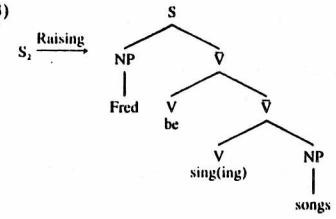
This structure contains three occurrences of the by now familiar [$_{\bar{V}}$V $\bar{V}$] configuration. Since that configuration appears in the output of Raising-to-subject (e.g., in *Fred seems to sing songs*), a possibility for the deep structure of sentences with auxiliary verbs now emerges. Suppose all auxiliary verbs are given the treatment that we have adopted for *seem:* that each auxiliary verb is taken to have a sentential subject in deep structure and to trigger an application of Raising. To see what derivations this would allow for, let us look at that for *Fred must have been singing songs*, ignoring for the moment the tense, *-en*, and *-ing*. The deep structure is as in (12):

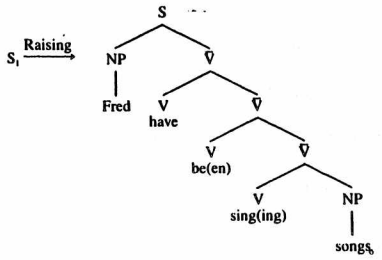
(12)

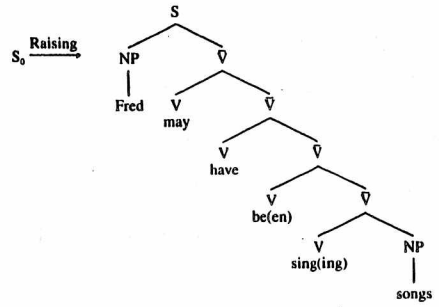


The derivation proceeds as follows, with applications of Raising on S_2, S_1, and S_0:

(13)



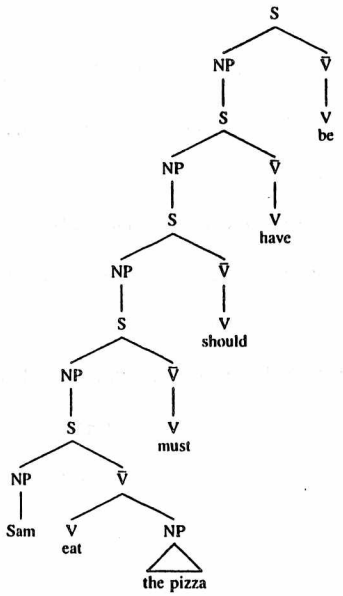




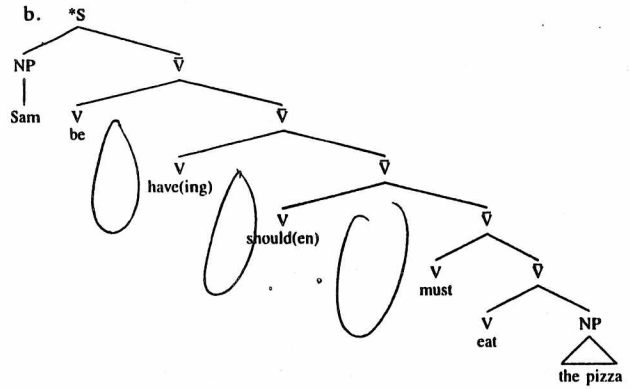
Note that the last tree in (13) is identical to the desired (11) except for being noncommital as to how the affixes fit in.

The proposal as developed so far says nothing about the order of auxiliary verbs. All that it says about each is that it takes a deep sentential subject and triggers Raising, and that does not exclude deep structures such as (13a) and corresponding surface structures such as (13b):

13 (14) a.



b. *S



Before jumping to the conclusion that the treatment of auxiliary verbs as main verbs with underlying sentential subjects implies that surface struc-

tures such as (14b) should be possible, let us ~~examine the ways in which we could~~ exclude such surface structures ~~other than by simply retreating to an analysis like Chomsky's.~~ Note first that over and above any purely syntactic considerations, there is a morphological reason for the ill-formedness of (14b), namely that that structure requires a past participle form of *should* and an infinitive form of *must*, and those verbs lack such forms. English modal auxiliaries have only finite forms, a present tense form (e.g., *can*) and a past tense form (*could*), and for most speakers *should* and *must* do not even have a past tense form, let alone infinitive and participle forms. There is thus no need to exclude the deep structure (14a) in order to exclude the surface structure (14b): the defective morphology of modal auxiliaries is sufficient to exclude (14b). It is in fact necessary to invoke the defective morphology of modals even under the Chomsky 1957 analysis of auxiliaries (though this has not been acknowledged by adherents of that analysis), because of those modal auxiliaries that have no past tense forms; ~~Chomsky's formula (4)~~ provides for all combinations of a present or past tense and any modal auxiliary, and defective morphology is the only plausible grounds for excluding combinations such as *must* + Past and *should* + Past.

The defective morphology of modal auxiliaries thus provides an explanation of why modal auxiliaries precede all other auxiliary verbs: a modal that followed another auxiliary verb would have to be in a form that its morphology does not allow. Let us now see whether there are any details of the behavior of perfect *have* that can provide an explanation of why it occurs where it does in sequences of auxiliary verbs. Consider the possibilities for combining tenses and/or *have* with various time adverbials:

(15) a. My brother is in Uruguay right now.
*My brother was in Uruguay right now.
*My brother has been in Uruguay right now.
*My brother had been in Uruguay right now.

b. Fred arrived at 2:00 yesterday afternoon.
*Fred arrives at 2:00 yesterday afternoon.
*Fred has arrived at 2:00 yesterday afternoon.
?Fred had arrived at 2:00 yesterday afternoon.

c. George has drunk a gallon of beer by now.
*George drinks/drank a gallon of beer by now.
*George had drunk a gallon of beer by now.

d. Nancy had already mailed the letter when I spoke to her.
*Nancy already mails the letter when I spoke to her.
*Nancy already mailed the letter when I spoke to her.
*Nancy has already mailed the letter when I spoke to her.

Adverbs referring to the present time (like *right now*) require the present tense, those specifying a past time (like *two hours ago* or *at noon yesterday*) require a simple past tense, those specifying a range of times extending from the past through the present (like *by now* or *since the last election*) require a present perfect, and combinations of an adverb that indicate a past time and one that places the event or state of affairs prior to that time (like *already* + *when I spoke to her*) require a past perfect.

In infinitives, however, the four-way distinction among present, past, present perfect, and past perfect is reduced to a two-way distinction between infinitive without *have* and infinitive with *have*:

(14) a. My brother is believed to be in Uruguay right now.
*My brother is believed to have been in Uruguay right now.
b. Fred is believed to have arrived at 2:00 yesterday.
*Fred is believed to arrive at 2:00 yesterday.
c. George is believed to have drunk a gallon of beer by now.
*George is believed to drink a gallon of beer by now.
d. Nancy is believed to have already mailed the letter when I talked to her.
d'. *Nancy is believed to already mail the letter when I talked to her.
d''. *Nancy is believed to have already had mailed the letter when I talked to her.

Note that not only the adverbs that in finite clauses require present perfect or past perfect but also those that require simple past tense require *have* in infinitives.

I assume that the rules governing co-occurrence between tenses, auxiliary verbs, and time adverbs are basically the same for nonfinite as for finite Ss. Let us provisionally implement that assumption by taking infinitive complements to have underlying structures in which the same four-way distinction is drawn as in finite clauses, with *right now* requiring a present tense, *at 2:00 yesterday* a past tense, etc., in infinitival Ss as well as in finite Ss. There then must be transformations having the following overall effect:

(17) Pres→$\emptyset$
Past→$have_{en}$
Pres $have_{en}$→$have_{en}$
Past $have_{en}$→$have_{en}$
} in infinitives

This correspondence between underlying and more superficial structure can be broken up into unitary processes as follows. Suppose that the first two lines of (17) are separated out as a transformation of **Tense-replacement** and that that transformation applies to **all** occurrences of Pres or Past in

infinitives, even those that are followed by $have_{en}$. This will give exactly the desired result when it applies to Pres $have_{en}$. In the case of Past $have_{en}$, however, it will result in *$have_{en}$ $have_{en}$, thus yielding ill formed sentences such as (15d") unless the grammar is altered in some way. Since the difference between (15d") and the sentence that expresses what (15d") ought to express, namely (15d), is that (15d") has one extra occurrence of $have_{en}$, we need to supplement Tense-replacement by an additional rule that deletes one of two consecutive occurrences of $have_{en}$. Before formulating these two rules, however, we should note that it is not only infinitives in which Tense-replacement applies but apparently **all** types of non-finite Ss. For example, it applies in *-ing* complements:

(17) a. Fred's being in Uruguay right now wouldn't surprise me at all.
a'. *Fred's having been in Uruguay right now wouldn't surprise me at all.
b. *Fred's arriving at 2:00 yesterday wouldn't surprise me at all.
b'. Fred's having arrived at 2:00 yesterday wouldn't surprise me at all.
c. *George's drinking a gallon of beer by now wouldn't surprise me at all.
c'. George's having drunk a gallon of beer by now wouldn't surprise me at all.
d. *Nancy's already mailing the letter when I talked to her wouldn't surprise me at all.
d'. Nancy's already having mailed the letter when I talked to her wouldn't surprise me at all.

It likewise evidently applies in the bare infinitives that follow modal auxiliaries:

(18) a. Fred may be in Uruguay right now.
a'. *Fred may have been in Uruguay right now.
b. *Fred may arrive at 2:00 yesterday.
b'. Fred may have arrived at 2:00 yesterday.
c. *George may drink a gallon of beer by now.
c'. George may have drunk a gallon of beer by now.
d. *Nancy may already mail the letter when I talked to her.
d'. Nancy may have already mailed the letter when I talked to her.

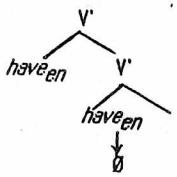
Under the assumptions that I am making in this chapter, the four ~~grammatical~~ acceptable sentences in (18) have respectively embedded present, past, present perfect, and past perfect ~~structures~~ Ss which

undergo Tense-replacement.[11]

We thus arrive at (19) as a tentative statement of Tense-replacement and *Have*-deletion:[12]

(19) a. Tense replacement Pres → Ø, Past → $have_{en}$ } in non-finite Ss

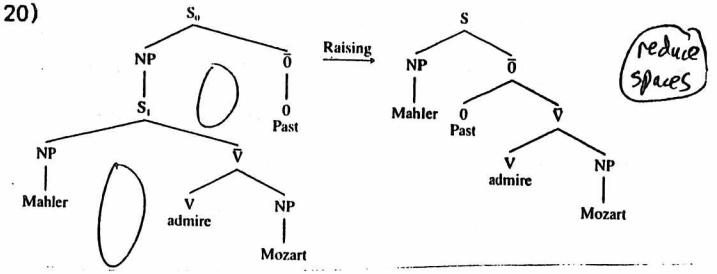
b. *Have*-deletion



This statement presupposes that the various Ss in a syntactic structure can be identified as finite or non-finite; we will return to this point later.

Let us now bring tenses into the analysis being developed here. If, as I have tacitly assumed in giving the formulation in (19), Tense-replacement simply replaces Past by $have_{en}$ without changing the structure, Past will have to appear in the same position in the input to Tense-replacement that $have_{en}$ appears in in the output. That means that Past (and Pres too, if the two tense markers are to be treated alike) must be given the same treatment that we have been giving to $have_{en}$, i.e. a tense marker is a deep structure predicate element with a sentential subject and triggers Raising:

(20)

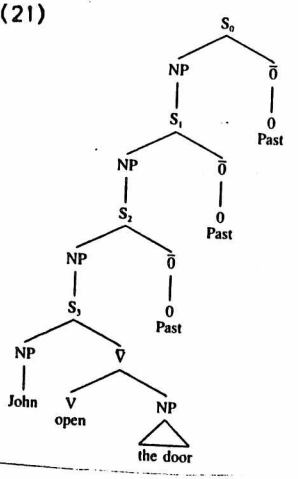


reduce spaces

The "0" in (20) is a makeshift device to indicate that Past (likewise, Pres) has no part of speech: it is not a verb, nor an adjective, nor a noun, etc.; 0' will then mean "phrasal unit whose head does not belong to any part of speech".

If tenses are predicate elements with deep sentential subjects, then they pose the same problem as auxiliary verbs did: that of reconciling the infinite number of possibilities that the deep structure seems to allow for with the quite small number of combinations in surface structure. For example, treating tenses as one-place predicates with sentential subjects seems to allow for deep structures such as (21) in which tenses are stacked:

(21)



Before we can decide whether deep structures such as (21) should be allowed, we must inquire what exactly a stack of tenses ought to underlie according to this analysis. To answer that question, we need to resolve one important detail of Tense-replacement that (19a) remains indeterminate, namely what exactly should count as non-finite. Since tenses are not generally thought of as taking complements, it is not obvious how the notion of "finite" should apply to their complements. Suppose that we in fact take the complements of tenses to be **non**-finite, which would mean that Tense-replacement would then be applicable on S_2 and S_1. This is not as counterintuitive as it might at first sound — it would follow, for example, from a policy that indicative main clauses and indicative *that*-clauses are finite[13] and that all other Ss are non-finite, i.e. a policy in which "non-finite" is taken to be the unmarked member of the finite/non-finite opposition. Tense-replacement would then convert the Past's of S_2 and S_1 into $have_{en}$, and *Have*-deletion would delete one of those two $have_{en}$'s, so that what results would be simply the past perfect *John had opened the door*. Indeed, the way that Tense-replacement works guarantees that tenses will appear only on the first verb (main or auxiliary) of a finite S: a tense in any other position would undergo Tense-replacement and thus either be deleted or appear in surface structure as $have_{en}$.

With this interpretation of "finite", the formulation of Tense-replacement in (19) in fact allows one to take **all** instances of *have*$_{en}$ to be underlying Past's: all instances of *have*$_{en}$ occur in what by the above stipulation are non-finite Ss, and thus if a Past underlay them the condition for converting it into *have*$_{en}$ would be met. Under this proposal, the present perfect always corresponds to underlying Pres + Past and the past perfect to underlying Past + Past, or to put it more accurately, they would correspond respectively to Pres... + Past and Past... + Past, since additional Pres's and Pasts would have no effect on the surface form.

The multiple underlying structures for present and past perfects that this proposal makes available are in fact no embarrassment, since they provide a natural account of some ambiguities in the perfect tenses that have largely been overlooked. On the basis of the time adverbials with which they co-occur, different instances of the past perfect can be identified as pasts of pasts, pasts of present perfects, and pasts of past perfects:

(22) a. When John arrived, Mary had left an hour before.

a'. Mary left an hour ago.

b. When John arrived, Mary had already left.

b'. Mary has already left.

c. When John arrived, two days earlier Mary had already finished the manuscript.

c'. Two days ago Mary had already finished the manuscript.

In (22a,b,c), *when John arrived* specifies a time that is used as **reference point**[14] for the main clause, and the content of the main clause, if expressed at that time, would have called respectively for the past (22a'), the present perfect (22b'), or the past perfect (22c'). Suppose that each occurrence of a tense refers to a point or interval of time, that a tense is normally accompanied by a time adverbial specifying that point or interval unless the time reference can be supplied from the context, and that a tense is past if its time reference is prior to that of the structure in which it is embedded (or, if it is not embedded, to the time at which it is uttered), and present if the time reference coincides with or is contained in that of the structure in which it is embedded. Our analysis then provides an account of the co-occurrence restrictions between tenses and time adverbials; in particular, it shows why past perfects usually require two time

adverbials: there is one time adverbial for the main past tense and one for the embedded past tense, realized as *have*$_{en}$.

For this approach to be generally valid, present perfects must be analyzed as involving a Past in the complement of a Pres, and multiple sources of present perfects, with more tenses than just the minimal Pres + Past must be admitted. While multiple sources of the present perfect are much harder to find examples of than multiple sources of the past perfect, (23a) and (23b) seem to be present perfects with, respectively, a simple past and a present perfect embedded in the basic Pres + Past of the present perfect:

(23) a. Ever since I started practising surgery, my patients have usually taken a stiff drink an hour or two before I operated.

b. As long as I've been conducting radio talk shows, the people who call in have all lived in Chicago since they were children.

The possibilities for co-occurrence with time adverbials, while not as neat as in the case of the past perfect, still fit this analysis reasonably well. The time adverbials that co-occur with the present perfect denote intervals that extend from the past through the present (*by now, already, since 1950, for the last ten years*), and the present tense can be taken as having that interval as its time reference. The embedded past tense that this analysis posits normally has no corresponding time adverbial, as a result of the role that the interval plays in the meaning of the present perfect: the present perfect expresses "at some time(s) in that interval" or "at all time(s) in that interval", and the understood "at some/all times" fills the semantic role that could otherwise be filled by a time adverbial that expressed a specific time.[15]

Let us thus assume that *have*$_{en}$ never occurs as such in deep structure, that is, that all surface occurrences of it are derived from underlying Past by Tense-replacement. We then have an explanation of the surface distribution of tenses and *have*$_{en}$. As observed above, a tense marker can appear in surface structure only on the first verb of a finite S because in any other position it would undergo Tense-replacement. A tenseless *have*$_{en}$ cannot be the first verb in a finite S, because the underlying Past that it corresponds to would then not be in the environment for Tense-replacement. And there cannot be more than one *have*$_{en}$ in a row in surface structure,

because if there were more than one (each derived from a Past), *Have*-deletion would delete all but one of them. Finally, the obligatoriness of a tense in a finite S amounts to a definition of "finite": in certain contexts (viz. as main indicative clause and as sister of a *that* or an interrogative complementizer), a S is required to have a tense as its topmost predicate; a S in such a context is (by definition) "finite".

One further aspect of *Have*-deletion is worth commenting on, namely the question of how a child acquiring English might learn that rule. Once a child has learned Tense-replacement and the correlations between time adverbials and tenses and auxiliaries that were discussed above, the most obvious way in which a child might learn *Have*-deletion would be by hearing a sentence such as (15d), in which a nonfinite S contains a combination of time adverbials that (in virtue of Tense-replacement) ought to contain two occurrences of *have* has only one, and adopting a rule which eliminates the discrepancy between what he observes and what he has already learned, namely one that deletes one of the *have*'s. However, nonfinite counterparts of past perfect sentences, as in (15d), are quite rare, and a person could very well go through his entire childhood without ever hearing such a sentence or without ever noticing the significance of the few examples that he might have heard of such combinations. Thus, the above hypothesis about how a child might learn *Have*-deletion implies that there should be large-scale individual variation with regard to whether such a rule is part of one's linguistic competence, variation that would be manifested in the relative acceptability of examples such as (15d), in which a second *have* is deleted, and (15d"), in which the two time adverbials are accompanied by two *have*'s. Such variation in fact exists: alongside the (common, but far from universal) acceptability judgements reported in (15), one also finds many speakers for whom the (15d") sounds more normal than (15d) and who presumably have not acquired the *Have*-deletion rule that is reflected in the responses of those who accept (15d) and reject (15d").

We have by now accounted for most of the distributional restrictions on auxiliary verbs that were noted in (3), without needing to stipulate a specific order of auxiliary verbs as part of the analysis. What remains to be accounted for is the fact that progressive *be* cannot precede modals or auxiliary *have*, the fact that passive *be* cannot precede any other auxiliary verbs, and the fact that the complements of *have*, progressive *be*, and passive *be* must be respectively in the *-en*, *-ing*, and *-en* forms.

I will argue that the restriction on progressive *be* is semantic rather than syntactic in nature and is the same restriction that applies to combinations of progressive *be* with main verbs. Progressive *be* is subject to the constraint that its complement refer to an **activity** or a **process** rather than a **state**:

(16) a. Alice is solving the problem.
a'. *Alice is understanding the problem.
a". I'm understanding this problem less and less the more I think about it.
b. Ted is acting like his father.
b'. *Ted is resembling his father.
b". Ted is resembling his father more and more every day.
c. When I ran into Janet, she was cursing her boss.
c'. *When I ran into Janet, she was disliking her boss.

Solving a problem is an activity, understanding it is a state, and gradually understanding it less is a process; acting like one's father is an activity, resembling him is a state, and day-by-day increase in the extent to which one resembles him is a process. An additional restriction on progressive *be* is that the time to which it refers must be included in the interval in which the activity or process is said to be going on, e.g., in (16c), the cursing takes place on an interval of time containing the time at which I ran into Janet.

Let us see whether these observations imply anything about the oddity of such sentences as

(17) a. *Fred is having arrived at 2:00 yesterday.
b. *George is having drunk a lot of beer by now.
c. *Irene is having played the bassoon nonstop for six hours.

If auxiliary *have* in (17a) is an underlying past tense corresponding to the time adverb *at 2:00 yesterday*, then the oddity of (17a) simply reflects the restriction that the complement of *be* denote an activity or process going on

in an interval containing the time in question: arriving at 2:00 yesterday isn't something that Fred can be in the middle of right now. The oddity of (27b) is a little trickier to account for, since George's drinking can very well be going on at the moment when (27b) is uttered, and if he has already drunk a lot of beer, he is in the middle of a larger act which will to an even greater extent constitute drinking a lot of beer. To say why (27b) is odd, we must be careful to distinguish what is actually the case from what a sentence says is the case. The sentence *George has drunk a lot of beer by now* is noncommital as to whether George has finished drinking or will continue drinking. It refers to the result of an activity carried on up to the present, not to the possible continuation of that activity into the future. If the restriction that the complement of *be* refer to an activity or process is regarded as not being fulfilled by sentences that refer to "results" (like the embedded *George has drunk a lot of beer by now* in (27b), which by this stipulation will count as denoting a state), then that restriction will exclude (27b). The same stipulation will then cover the oddity of (27c): while playing the bassoon is an activity, the complement of *be* in (27c) refers not to the (possibly ongoing) activity of playing the bassoon but to the state consisting in six nonstop hours of the activity having taken place.

The conditions on the use of progressive *be* are in fact somewhat more complicated than this. Even state predications allow (often, indeed, require) the progressive when they refer to temporary rather than permanent states:

(28) a. The bottle is lying on its side.
a'. *Libya is lying between Egypt and Tunisia.
b. After the bombing, only three buildings were still standing.
c. Several books were sitting on the shelf.

The requirement for a progressive in examples like (28a, b, c) is to some extent an idiosyncracy of "gestalt" verbs such as *lie, stand,* and *sit*. However, virtually any stative verb can appear in a progressive when the sentence refers to repeated temporary states:

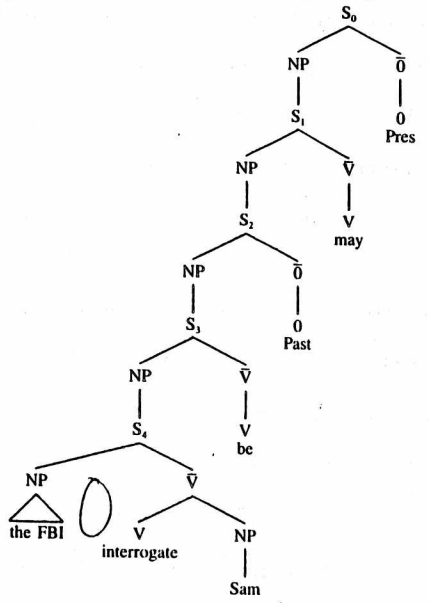
(29) a. You amaze me—you're always knowing things that I would expect only an expert to know.
b. It's uncanny—whenever I run into you, you're always looking like some other person I know.
c. Whenever I see you, you're always just having returned from a vacation.

Of particular interest is (29c), ~~discovered by~~ first discussed by Schachter (1983:161), in which progressive *be* precedes auxiliary *have*, a possibility that Chomsky's

formula does not allow for. Schachter concludes that the *be having* combination is actually not systematically excluded, though it is rare because in most cases it would violate the semantic restrictions on progressive *be*.

I turn now to passive *be*. According to the analysis adopted in ~~chapter 4~~, the passive transformation adjoins passive *be* to the $\bar{V}$, creating a $[_{\bar{V}}V\ \bar{V}]$ configuration, as it moves the two NPs. With the deep structure (30b), in the derivation of (30a) Passive must apply to S_4 rather than to any of the higher Ss if passive *be* is to follow all the other auxiliary verbs:

(30) a. Sam may have been being interrogated by the FBI.
b.

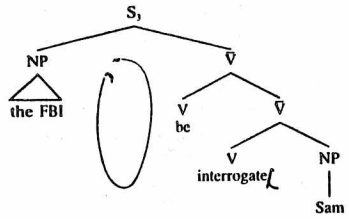


That is, ~~if Passive applies to S4 it will form~~ the derived $\bar{V}$ *be interrogated by the FBI*, and subsequent applications of Raising will yield structures in which the other auxiliary verbs precede that $\bar{V}$, but if Passive were to apply to one of the higher Ss (after Raising had applied to that S, since otherwise there would be no NP in the $\bar{V}$ to be turned into a derived subject), passive *be* would be adjoined to a $\bar{V}$ that began with *be interrogating, have been interrogating*, etc., and one of the sentences in (31) would result:

(31) a. *Sam may have been interrogating by the FBI.
b. *Sam may be had been interrogating by the FBI.
c. *Sam is may-en have been interrogating by the FBI.

However, we have already seen a condition on the application of Passive that will exclude its application to any of the higher Ss in (30b). For Passive to apply to, say, S_3, Raising would have to have already applied to S_3, and thus the input to Passive would be (32):

(32)



However, application of Passive to a structure like (32) would violate the constraint noted in chapter 4 that the NP that is to become the derived subject must be a $\bar{V}$-mate of the verb, e.g., (31a–b) do not have the passive counterparts (31a′–b′):

(31) a. Small businessmen [$_V$ seem to [$_V$ fear the IRS]].
a′. *The IRS is seemed to fear by small businessmen.
b. Alice [$_V$ happens to [$_V$ dislike Marvin]].
b′. *Marvin is happened to dislike by Alice.

Note that in (32) *Sam* and *be* are not $\bar{V}$-mates. Thus, the same condition on Passive that excludes (32a′, b′) will also exclude (31a) (and similarly, (30b–c)): under an analysis in which each auxiliary verb is the predicate element of its own deep structure S, a derivation of (31a–c) would have to involve an application of Passive that extracted the NP from a structure of the form [$_V$V [$_V$ . . . NP . . .]], and Passive is subject to a condition that rules out such a step.

Now let us take up *-en* and *-ing*. In the deep structures proposed in Chomsky 1957, *-en* and *-ing* are immediate right sisters of *have* and *be* (see (5a) above); they are attached to the following verb by the same transformation ("Affix-hopping") that purportedly attaches a tense to a following verb. The only reason that I have ever seen adduced for having *-en* and *-ing* present at all in deep structures is that by having them in the particular deep structure positions where Chomsky posits them, one can "catch a free

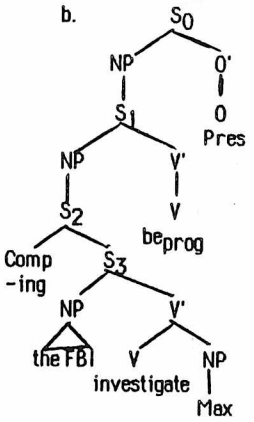
(in Zwicky's [1970] words)

Now let us take up *-en* and *-ing*. The *-ing* that accompanies progressive *be* can be identified with the ('s or Accusative) *-ing* complementizer: the Complementizer-placement transformation of S5a suffices to put it on the appropriate verb, and the cyclic principle guarantees that Comp-pl will interact properly with other relevant transformations such as passive. For example, if (32a-a') share the deep structure (32b), Passive will only be able to apply with S_3 as domain, and thus Comp-pl, whose domain here is S_2, will correctly attach *-ing* to *investigate* if Passive is not applied but to *be* if Passive is applied:

(32) a. The FBI is investigating Max.

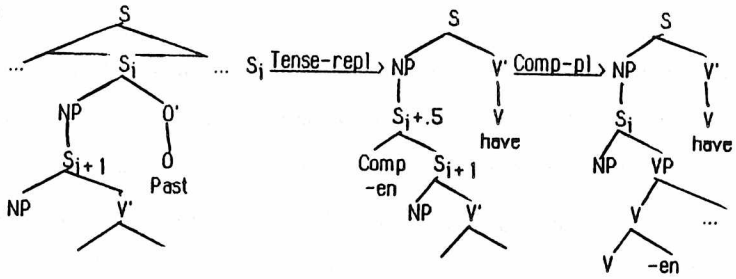
a'. Max is being investigated by the FBI.

b.



It is not so easy, however, to treat the *-en* that accompanies passive *be* and auxiliary *have* as a Comp, at least if one maintains the analyses presented above, in which both passive *be* and auxiliary *have* are inserted by transformations. Even if one were to take the insertion of those verbs as accompanied by the addition of *-en* as a Comp, the application of Comp-pl that would put *-en* on the appropriate verb would violate the cyclic principle. For example, in a derivation such as the following, Comp-pl would have to apply with $S_{i+.5}$ as domain after Tense-replacement had already applied with the higher S_i as domain:

(33)



(The two steps in (33) are given as coming before Raising$_i$; the point would remain unchanged even if they followed Raising.) There is thus no real alternative to attaching *-en* to the lower V as a concomitant of the insertion of *have* and passive *be*, not reducible to Comp-placement, and henceforth I will assume that it is so inserted.[17]

Either version of attachment of *-en* and *-ing* is consistent with the approach to auxiliary verbs adopted in this chapter. If one wants the movement transformation version, one simply has to have *be -ing* and *have -en* where structures such as (12) have just *be* and *have* (in which case Tense-replacement must replace Past not with *have* but with *have -en*). If one wants the insertion transformation version, one posits a transformation adding *-en* or *-ing* to the topmost predicate element of the complement of *have* or passive *be* (*-en*), or progressive *be* (*-ing*).

To recapitulate, auxiliary elements come in the order in which they do because (i) tenses other than on the first verb undergo Tense-replacement, so only the first verb can bear a tense; (ii) modal auxiliaries have only finite forms and a modal that was preceded by another auxiliary would have to be in a nonfinite form, so the morphology of modal auxiliaries prevents them from following any other auxiliary verb; (iii) *Have*-deletion deletes all but the first of two or more consecutive auxiliary *have*'s, so no more than one can occur; (iv) complements headed by auxiliary verbs other than passive *be* usually (though not always—cf. (7c)) violate the restriction that the complement of progressive *be* denote an activity or a process, so progressive *be* normally cannot be followed by any other auxiliary verb besides passive *be;* (v) passive *be* could precede an auxiliary verb only as a result of passivization of a clause headed by that auxiliary, which would violate the constraint that the V and the NP that become the derived subject be $\bar{V}$-mates, so passive *be* must follow any other auxiliary verbs; and (vi) Ss in certain contexts are required to have a tense as the topmost predicate, and being in such a context is what it is to be a finite S, so every finite S must have a tense.

This last remark calls for some comment. The use of the term "finite" in this chapter presupposes that the different contexts in which Ss occur impose on the S either a requirement that there be a surface tense or a requirement that there not be any surface tense. This distinction between finite and nonfinite Ss is independent of the distinction between semantically tensed and semantically tenseless Ss. There have in fact been numerous examples in this chapter in which a nonfinite S has an underlying tense (which must then undergo Tense-replacement), and indeed, all four combinations of deep and surface tensed and tenseless are attested:

	deep tensed	deep tenseless
surface tensed	John said that he was tired.	Jap. *John wa piano o hiku koto ga dekiru.* 'John can play the piano.'
surface tenseless	We believe John to have stolen the money.	John can play the piano.

NOTES

1. For the moment, I will assume that we know what words are auxiliary verbs. In S8d, some syntactic properties characteristic of auxiliary verbs will be discussed that can be used as criteria for deciding whether certain unclear cases are auxiliary verbs.

A fair number of speakers reject sentences like the last two examples in (1). As far as I can determine, they differ from speakers of the variety of English discussed here only in having a constraint that excludes the combination *be(en) being*, irrespective of whether the second *be* is an auxiliary verb.

2. There is in fact considerable dialect variation and individual variation with regard to the possibilities for combining auxiliary verbs; later we will mention dialects (principally in the Southeastern United States) in which certain combinations of two or even three modal verbs occur, and idiolects in which two instances of auxiliary *have* in a clause is possible, as well as conditions under which many speakers allow progressive *be* to precede auxiliary *have*.

3. In what was for many years the most celebrated and influential account of the restrictions on the cooccurrence of auxiliary verbs and verbal affixes, that of Chomsky 1957, there was held to be a deep structure constituent consisting of all the auxiliary verbs and verbal affixes that occurred in the given clause. Leaving aside passive *be*, which was given special treatment, both the order of the auxiliary verbs and their cooccurrence with particular inflections were accounted for in terms of a rule directly stipulating orders corresponding to the approximation given above:

Aux → Tense (Modal)(*have -en*)(*be -ing*)

Here "Aux" is the name of the putative category of a unit consisting of one or more auxiliary verbs. ("Aux", pronounced [ks], shares with *Ms.* the peculiarity of looking like an abbreviation but not really being an abbreviation of anything; note that it does not mean "auxiliary": *must have been* is no more an auxiliary than *in El Paso on Tuesday with a chainsaw* is a P'.) The parentheses, indicating "optional" material, are employed in such a way that if either *have* or progressive *be* is present, *-en* or *-ing* (respectively) will acompany it. In the deep structures conforming to this rule, the "affixes" (Tense, *-en*, and *-ing*) precede the words that they are affixed to in surface structure, and the derivation must thus involve steps in which the affixes are moved from their underlying to their surface positions. Since Chomsky accounted for the order of auxiliary verbs simply by giving a rule that said what their order was to be and since the descriptive machinery of early transformational grammar allowed an order to be imposed on constituents only through a rule that specified what could be the daughters of a node of a given category and what the order of those daughters was, he was forced to accept a constituent structure in which the auxiliary verbs were sisters of one another. The policies on syntactic categories that Chomsky assumed forced him to treat auxiliary verbs in his 1957 analysis as not being verbs, indeed as belonging to no category at all (other than that of "Modal" in the case of modal auxiliaries).

4. Actually, some of the modals have senses in which they do not allow "funny NP" subjects, e.g. the "be able" sense of *can*:

*When I was a boy, there could appear stars.

The different senses of modals thus can differ with regard to whether they are one-place predicates with Raising or two-place predicates with Equi. The two-place senses of modals will be ignored here.

5. *Should* and *must* are historically the past tenses of *shall* and the obsolete *mot*, but they function in current English as present tense forms. For some speakers, *must* can be used both as a present and as a past tense forms. Such speakers accept sentences like (i), which most speakers of English can express only as (i'):

i. %When I received the news, I must leave.

i'. When I received the news, I had to leave.

6. What, then, is the difference between the "standard" variety of English described here, which allows only one modal auxiliary per clause, and the various Southern American dialects that allow some (though not all) combinations of two or more modal auxiliaries? Boertien (1986) argues that in most of the double modal combinations it is the second modal that bears the tense; for example, in dialects that allow both *might can* and *might could*, only the latter can be combined with adverbials that require a past tense:

You might could/*can have been killed yesterday.

In such combinations, perhaps the first auxiliary (here, *might*) has been reanalyzed as an

adverb, albeit one that is only allowed to modify a limited range of Vs or V's.

In note 19, two cases will be brought up in which failure of modal auxiliary verbs to occur in non-finite forms cannot plausibly be attributed to defective morphology.

7. The reason that this example sounds more normal than the two preceding ones is that it can be embedded in contexts that provide a time between 2:00 yesterday and the present to serve as a 'reference point'.

8. The significance of these facts for the syntax of auxiliary *have* was first noted in Hofmann 1966.

9. There is in fact considerable individual variation in the acceptability of non-finite counterparts of past perfect clauses, as in (15d,d"). The significance of this variation will be taken up later in this section.

10. I use $have_{en}$ as a makeshift to distinguish auxiliary *have* from main verb *have*. The latter does not participate in the alternation summarized in (16):

Popov had a heart attack last week.

Popov is believed to have had a heart attack last week.

*Popov is believed to have a heart attack last week.

11. Since the embedded tenses are in the underlying structure over and above the present tense of *may*, I conclude that Chomsky's formula (note 3) allows too few underlying combinations of tenses and auxiliary verbs: in the structures underlying these sentences, **two** tenses are required, e.g. in (18b') the present tense on *may* and the past tense that is realized as $have_{en}$.

12. The rules in (19) are adapted from Hofmann 1966. The lower $have_{en}$ is the one indicated as deleted, because syntactic influence normally is exerted downwards: a higher element will cause deletion of a lower one and not vice-versa.

13. In addition, conjoining and modification are 'transparent' to finiteness: if a coordinate S is finite, so are all of its conjuncts, and if a S of the form [modifier S] is finite, so is the modified S.

14. An analysis of English tenses and auxiliary verbs in terms of 'reference points' was first developed in Reichenbach 1947. A very similar approach to Spanish tenses, apparently developed independently, is found in Bull 1963. For further details of the meaning of the present perfect,

see McCawley 1971, 1981c.

15. While the present perfect does not allow time adverbials that pick out a particular time, as in (i), it does allow adverbials that pick out an open-ended set of times, as in (ii):

i. *In the last month, I have received an obscene phone call last Monday.

ii. In the last year, I have often received obscene phone calls on Mondays.

16. There is considerable individual variation in the acceptability of (27c). While most speakers rate it considerably higher in acceptability than **George is having lived in Toledo for 30 years*, many rate it less than fully acceptable. For speakers for whom combinations of *be having* (as (27c)) that do not violate the semantic restriction on the complement of progressive *be* are still of lowered acceptability, it may be necessary to posit restrictions on the order of auxiliary verbs such as are embodied in Chomsky's formula (note 3). However, those restrictions would have a very different status from the status that Chomsky's formula had in his 1957 analysis: they would be largely redundant, and violations of them would reduce acceptability only by small amounts.

17. In the analysis proposed in Chomsky 1957 (see note 3), *-en* and *-ing* are immediate right sisters of *have* and *be* and get attached to the following verb by the same transformation ("Affix hopping") that purportedly attaches a tense to a following verb. However, the supposed Affix-hopping transformation conflates three different processes of attachment of affixes to verbs: (a) **Attraction-to-tense**, which combines a tense with an auxiliary verb and is in the cycle, (b) **Tense-hopping**, which combines a tense with a main verb and is postcyclic, and (c) whatever inserts *-en* and *-ing* into the complements of verbs that demand them. That (a) differs from (b) in being in the cycle can be shown by contrasting the evidence that Tense-hopping was postcyclic given in §6c with analogous examples where there is an auxiliary verb:

i. Alice bought a computer, and Fred did Ø too.

i'. Alice has bought a computer, and Fred has/*does Ø too.

i". Alice is writing a novel, and Fred is/*does Ø too.

The "Affix-hopping" of (i) has to be postcyclic in order for the input to V'-deletion to contain two copies of tenseless *buy a computer*. But if the step that combines the tense with the auxiliary verb

of *have bought a computer* or *be writing a novel* in (i'-i") were also postcyclic, it should be possible to delete those V's and obtain the asterisked versions of (i'-i"). By contrast, if it is cyclic, *bought a computer* and *writing a novel* will be the only tenseless V's in the input to V'-deletion, and thus only the acceptable versions of (i'-i") will have derivations.

In examples like (ii-iii), attachment of *-en* and *-ing* behaves like the cyclic Attraction-to-tense and unlike the postcyclic Tense-hopping:

ii. Alice has bought a computer, and Fred has (*done) Ø too.

ii'. Alice has been working overtime, and Fred has (been (*doing)) Ø too.

iii. Alice is writing a novel, and Fred is (*doing) Ø too.

Attachment of *-en* and *-ing* within each conjunct cannot be postponed until V'-deletion gets its chance to apply to the whole sentence, since if it could, it should be possible to delete the V' leaving the *-en* and *-ing* behind, thus obtaining the unacceptable versions. By contrast, if attachment of *-en* and *-ing* is in the cycle, there will be no well-formed derivations for those sentences, while derivations for their acceptable counterparts will still be available. A further difference among the three rules (a concomitant of the fact that one of them is postcyclic and the other two cyclic, if Pullum's conjecture that postcyclic transformations must be "local" is correct) is that while an intervening adverb or *not* inhibits the application of Tense-hopping (and thus results in a sentence with *do*), it does not inhibit the other two cases of "Affix-hopping":

iv. Fred didn't buy a computer.

v. Fred has [not given me any money] many times.

v'. *Fred has done not give me any money many times.

vi. Fred has been [not giving anyone any money] recently.

vi'. *Fred has been doing not give anyone any money recently.

Since Attraction-to-tense is restricted to auxiliary verbs, while attachment of *-en* and *-ing* affects main and auxiliary verbs alike, no two of the three cases of "Affix-hopping" have the same conditions of application.

The asterisked version of (ii) is in fact normal in British English, though the asterisked versions of (ii', iii) are not. I make no attempt here to account for this difference between British

and American English; for further discussion of that difference, see Baker (1984) and Trudgill and Hannah (1985: 53-54).

•no 18•

19. Boertien (1979:88-90) discusses a case where this statement is inaccurate. By all reasonable criteria of modalhood, the *is to* of *Fred is to leave at 5:00* is a modal auxiliary. In particular, it never appears in non-finite forms:

*Fred is believed to be to leave at 5:00.

*Fred's being to leave soon is scandalous.

*Fred may be to leave at 5:00.

However, it cannot be defective morphology that rules these sentences out, since *is to* shows the same spectacularly suppletive paradigm that *be* has elsewhere (*I am to leave, You are to leave, I was to leave*, ...) and thus must involve the same morpheme *be* that occurs in other constructions and that in its other uses has a full set of non-finite forms. Akmajian, Steele, and Wasow (1979: 18) make a similar point about the modal and non-modal uses of *need*: the absence of non-finite forms of modal *need* cannot be because of defective morphology, since non-modal *need* has the missing forms:

Sam doesn't need to go home.

Sam need not go home.

Sam is believed to not need to go home.

*Sam is believed to {need not / not need} go home.

Sam's not needing to go home is remarkable.

*Sam's {needing not / not needing} go home is remarkable.

20. Superscript + and - indicate whether the Ss in question are finite or nonfinite.

21. The ? after the % in (13) indicates that the variation is between being completely normal and having the slight oddity that is indicated by ?. These sentences are normal in British English but slightly odd in American English.

22. In attaching the label V to *have + not* and V' to *not + have read the report* in the last two

delete last 7 lines on p. 338.
replace pp. 339-341 by 11.21-25

We may then formulate our tentative generalization about the cases in which backwards pronominalization was unacceptable in (3)-(7) as the following restriction, first proposed by Langacker and Ross:

(9) An AD X may not precede its antecedent Y if either (i) X is in one conjunct of a coordinate structure and Y in a later conjunct or (ii) X commands Y.

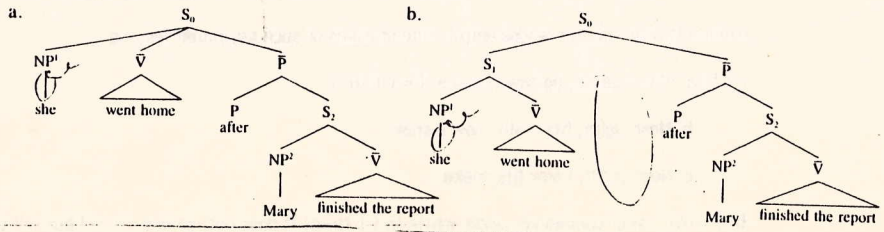
With a view towards making it easier to introduce some alternative conceptions of command that will become relevant shortly, let me recast the above characterization of 'command' in terms of a notion of **bounding node**. For the notion of command defined above, the nodes labeled S are 'bounding nodes' in the sense that they are the nodes that stop the upward movement in the tracing procedure just sketched. Other notions of command differ from this one with regard to the condition that defines 'bounding node'. In general, any condition X that defines what is to count as a bounding node generates a corresponding notion of command:

(10) For any condition ϕ, a node X in a given tree ϕ-commands a node Y if one can get from X to Y by tracing upwards along the branches of the tree until one first hits a node meeting the condition ϕ and then tracing downwards from there. [revised below]

One can then refer to the notion of command that was defined above as 'S-command', using 'S' as a shorthand for the condition 'bears the label S' that defines the bounding nodes.

One correction will have to be made in this characterization of "command" if the constraint on backwards pronominalization is to be stated as allowing an AD to precede its antecedent only if it does not command the antecedent. The notion of command was originally introduced (Langacker 1969, Ross 1967b) within a framework in which a S-modifier was a daughter of the modified S-node (ϕa), rather than being a sister of it the way that it is in the analyses adopted here (ϕb):

(ϕ) a.



b.

The first S-node that one hits in tracing upwards from NP^1 in (10a) is S_0, and thus with that structure, *she* commands *Mary*. But with (10b) as the structure, if we trace upwards from NP^1, the first bounding node that we reach is S_1, and we cannot reach NP^2 by tracing downwards from that node. So that we can accept roughly the same generalization that Langacker and Ross proposed while retaining structures such as (10b), we need to alter the definition of command so that NP^1 will command NP^2 even in (10b). Since it is precisely modifiers of a bounding node that are responsible for the discrepancy between the desired implications of (9) and the implications that it has when combined with the correct constituent structure, the most straightforward way to eliminate the discrepancy is to make Ss that are combined with modifiers (such as S_1 in (11b)) not count as bounding nodes. More generally, I will adopt a general policy that a **modified node**, that is, a node which is combined with a modifier into a larger constituent, will not count as a bounding node and incorporate that policy into a revised version of (10):

(10') For any condition ϕ, a node X in a given tree ϕ-commands a node Y if one can get from X to Y by tracing upwards along the branches of the tree until one first hits a non-modified node meeting the condition ϕ and then tracing downwards from there.

Clearly, (9) is only an approximation to the truth. For one thing, it says nothing about the degrees of acceptability that we noted above, e.g. it does not distinguish between the mild oddness of (6c') and the gross deviance of (6b'). When we take up certain structures that we ignored in arriving at (9), we find discrepancies between prediction and observation. For example, according to (9), (12a-b) should be unacceptable, but in fact many speakers find them fully acceptable and most others find (12a) only mildly deviant and (12b) even less so:[15]

(12) a. %?His mother loves John.

b. (?)Only his mother loves John.

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does not distinguish between the mild oddness of (6c′) and the gross deviance of (6b′). When we take up certain structures that we ignored in arriving at (11), we find discrepancies between prediction and observation. For example, according to (11), (12) should be unacceptable, but in fact many speakers find it fully acceptable and most others only mildly deviant:

(12) %?His mother loves John.

While (11) imposes no restriction on forward anaphora, we have already encountered cases in which forward anaphora is excluded:

(13) a. Near him, John saw a snake.
b. *Near John, he saw a snake.

Reinhart (1976, 1983) argues that not command but another notion of subordination must be invoked in order to account adequately for examples like (12)–(13) and also suggests that the dichotomy that has been drawn between forwards and backwards anaphora is a mistake. Note that the *he* (of *his* = *he* + *'s*) in (12) is in a sense subordinate to the rest of the sentence, in virtue of being a proper part of the NP *his mother*. If

we were to take not only S-nodes but also NP nodes as bounding nodes, then *he* would not command *John* in (12). Suppose we attempt then to see whether we can characterize "bounding node" in such a way that what is excluded is structures in which an AD "commands" its antecedent, in an appropriate sense of "command". An obvious question to ask is then whether any nodes other than S-nodes and NP-nodes will be bounding nodes for that notion of command. For example, are V'-nodes also bounding nodes? Let us accordingly look at pairs of examples as in (14), where an object pronoun and a subject pronoun are combined with an antecedent that will be argued below to be in a S-modifier:

(14) a. Mary hit him before John had a chance to get up.

a'. *He ran into Mary before John had a chance to hide.

b. Mary gave him a dollar before John could refuse.

b'. *He took a dollar from Mary before John realized that Ann was watching.

If the *before S* expression is in fact a S-modifier and V'-nodes are bounding nodes for the relevant notion of command, then the pronoun commands the antecedent in (14a',b') but does not command it in (14a, b). There are of course many ways of defining "bounding node" in such a way that S-, NP-, and V'-nodes (and perhaps some additional nodes) are bounding nodes; let us, however, for the sake of directing our attention to a particularly influential proposal, concentrate on a notion that is known as **c-command**:

(15) c-command = ϕ-command, with ϕ (the condition defining 'bounding nodes') being: 'belongs to a major category (i.e. S, NP, or X')'.

That is, the nodes that a given node X^1 c-commands are those that can be reached from X^1 by tracing up the tree until one reaches a major category node and (in view of the qualification about modifiers that was above) continuing upwards if there are any modifiers of that node until one reaches a node that dominates all of them, and then tracing downwards. Thus, e.g. in (8) the A node c-commands everything dominated by the A' node, and nothing else; the *was* node c-commands everything dominated by the V' node, and nothing else.

Reinhart proposes (16) as a constraint not only on backwards but also on forwards anaphora:

(16) An AD must not c-command its antecedent. [revised in (30)]

Since *he* in (13b) c-commands *John*, (13b) violates (16). However, in (12), neither of *he* and *John* c-commands the other (*he* c-commands only the material of *his mother*, and *John* c-commands only the material of *loves John*), and thus there is no violation of (16). According to (16), there should be an asymmetry between subjects and non-subjects, since the subject c-commands everything in its S, while a NP within a V' c-commands nothing outside of the V' (and the modifiers of the V') and a NP that is properly contained in the subject c-commands nothing outside of the subject. Thus it should be possible for a subject to violate (16) even though an object, or even a NP that is a proper part of the subject, in an otherwise similar example does not violate it. Reinhart provides ample illustrations of such asymmetries, e.g.

(17) a. *Near John, he saw a snake. (= (13b))

b. Near John, his sister saw a snake.

c. Near John, I saw his snake.

In (17a), *he* c-commands *John*, while in (17b-c) it does not, so that (17a) but not (17b-c) violates (15).

material of *his mother*, and *John* c-commands only the material of *loves John*), and thus there is no violation of (15). According to (15), there should be an asymmetry between subjects and nonsubjects, since the subject c-commands everything in its S, while a NP within a $\bar{V}$ c-commands nothing outside of the $\bar{V}$ (and the modifiers of the $\bar{V}$) and a NP that is properly contained in the subject c-commands nothing outside of the subject. Thus it should be possible for a subject to violate (15) even though an object, or even a NP that is a proper part of the subject, in an otherwise similar example does not violate it. Reinhart provides ample illustrations of such asymmetries, e.g.,

(16) a. *Near John, he saw a snake. (= (13b))
b. Near John, his brother saw a snake.
c. Near John, I saw his snake.

In (16a), *he* c-commands *John*, while in (16b–c) it does not, so that (16a) but not (16b–c) violates (15).

A particularly striking class of examples in which c-command correctly draws a distinction that is missed by command is that of sentences with backwards pronominalization in which the antecedent is inside an adverbial clause:

(17) a. Mary hit him before John had a chance to get up.
a′. *He ran into Mary before John had a chance to hide.
b. Mary gave him a dollar before John could refuse.
b′. *He took a dollar from Mary before John realized that Ann was watching.

Here backwards pronominalization appears to be allowed (or at least to be reasonably acceptable) when the pronoun is within the $\bar{V}$ of the main clause but to be thoroughly unacceptable when the pronoun is the subject of the

I return now to the question of how exactly the notion of c-command applies to the examples in (14). Recall that it was claimed in §8e that S-modifying adverbs are underlying

adjuncts to the main S but can optionally be made adjuncts of the $\bar{V}$. The optionality of this step is shown by the fact that both the underlying host S (*Mary hit Bill*, in the case of (17a)) and the derived $\bar{V}$ (here, *hit Bill before John could stop her*) can serve as conjuncts in related sentences involving coordination:

(18) a. [Mary hit Bill and Nancy hit Tom] before John could stop them.
b. Mary [[hit Bill before John could stop her] and [started screaming at John]].

11.25

delete last 3 lines on p. 345.
replace p. 346 and up to (34a) on 347 by 31-40

In both (27) and (28), the discrepancy between Reinhart's condition and the facts involves forwards pronominalization with an antecedent in a subordinate clause. Such examples led Carden (1986a) to conclude that anaphoric relations between clausemates are subject to different restrictions than are anaphoric relations between non-clausemates. In particular, it appears as if an appealing feature of Reinhart's condition, namely its blindness to word order, cannot be maintained in general: while a pronoun c-commanding its antecedent seems to be enough to make the anaphoric relation unacceptable if the pronoun and antecedent are clausemates, it is not enough if they are not clausemates. The relevant difference between the unacceptable (29a-a') and the acceptable (29a") appears to be the fact that that the AD and antecedent are clausemates in the former, while the antecedent in the latter is in a lower clause than the AD, and since the AD c-commands its antecedent equally much in the unacceptable (29b) and the acceptable (29b'), the difference in linear order is apparently responsible for the difference in acceptability:

(29) a. *Near John, he saw a snake.

a'. *Near John's mother, he saw a snake.

a". Near the car that John was repairing, he saw a snake.

b. *She went home after Mary had finished the report.

b'. After Mary finished the report, she went home.

The most straightforward way to state these conditions is as in (30), in which the pristine condition proposed by Reinhart (16) is qualified by clauses that keep it from incorrectly excluding sentences such as (29a", b'):

(30) **Conditions on surface structure**. An AD may not c-command its antecedent if it

(i) is a clausemate of the antecedent or (ii) precedes the antecedent.

Carden also noted a class of cases that present a serious difficulty for another characteristic of Reinhart's analysis, namely that her restriction on anaphoric relations (16) is supposed to apply only to surface structure:

(31) a. Near him is where John saw the snake.

a'. *Near John is where he saw the snake.

b. It was near him that John saw the snake.

b'. *It was near John that he saw the snake.

Under the most commonly accepted surface structures for such sentences, neither of the two NPs c-commands the other and thus no violation of (16) is possible. Moreover, there are acceptable sentences whose surface structures appear to differ in no relevant detail from those of the unacceptable (31a',b'):

(32) a. Near John was what he desperately wanted.

b. It was lucky for John that he saw the snake.

Carden took such examples to show that in at least some cases anaphoric relations are constrained by a condition that relates to an underlying level of structure. Specifically, he assigned to cleft sentences a deep structure containing the non-cleft analog as a constituent and took the unacceptability of examples like (31a', b') to reflect the unacceptability of the anaphoric relation in an intermediate stage in the derivations of (31a', b'). Specifically, he proposed that anaphoric relations are subject to constraints not only on the surface structure of the sentence but also on the **cyclic outputs**, i.e. the structures at the end of the application of the cyclic transformations to each domain. The cyclic output for the embedded S that he posits in (31a',b') corresponds to **He saw the snake near John*, and the whole sentence inherits the unacceptability of the cyclic output even though the surface positions of the pronoun and antecedent violate no plausible constraint on surface structures. By contrast, the sentences in (32) would not involve any embedded S whose cyclic output had *John* and *he* in an inadmissible structural relationship. Carden's proposal likewise accounts for the unacceptability of pseudo-cleft sentences such as (33a,b,c), in which the antecedent of a pronoun is in an underlying complement that is moved into predicate position; here again, the pronoun c-commands its antecedent in a cyclic output but not in surface structure:

(33) a. *What I concealed from him was that John had offended Mary.

a'. *I concealed from him that John had offended Mary.

a". What I concealed from John was that he had offended Mary.

b. *What he was oblivious to was John's being regarded as a fool.

b'. *He was oblivious to John's being regarded as a fool.

b". What John was oblivious to was his being regarded as a fool.

c. *What he didn't realize was that John was dying.

c'. *He didn't realize that John was dying.

c". What John didn't realize was that he was dying.

Stating the relevant condition on cyclic outputs is not such an easy matter, and before attempting a formulation of it, it will be necessary to clarify what exactly the condition should exclude. It will not do simply to exclude cyclic outputs in which an AD c-commands its antecedent, since such a restriction would rule out all of the sentences that (30) was carefully set up so as not to rule out: the surface structures of (29a", b') differ only in extraneous details from the cyclic output of the highest S in their underlying structures and thus (29a", b') would be excluded by a condition that an AD must not c-command its antecedent in a cyclic output. Thus, the condition that we seek must be stated in terms of a narrower relation than c-command.

However, the condition that we seek should do more than just rule out inadmissible AD-antecedent combinations: rather, it should rule out sentences in which a pronoun is required in a certain position but something else is used instead. Note, for example, that we need to exclude not only sentences in which a pronoun is higher than its antecedent (34a) but also sentences of the same form in which a full NP or an anaphoric epithet (34b-b') appears in a position in which a pronoun is required if the NP in that position is to refer to the person in question:

(34) a. *He$_i$ read in the Tribune that Uncle George$_i$ had won the lottery.

b. *Uncle George$_i$ read in the Tribune that Uncle George$_i$ had won the lottery.

b'. *Uncle George$_i$ read in the Tribune that the old bastard$_i$ had won the lottery.

c. Uncle George$_i$ read in the Tribune that he$_i$ had won the lottery.

Note that (34a-b') have to be excluded by a condition on cyclic outputs, since corresponding pseudo-cleft sentences are equally bad, while other sentences with surface structures parallel to those of the pseudo-clefts are good:

(35) a. *What he$_i$ read in the Tribune was that Uncle George$_i$ had won the lottery.

a'. *What Uncle George$_i$ read in the Tribune was that Uncle George$_i$ had won the lottery.

a". *What Uncle George$_i$ read in the Tribune was that the old bastard$_i$ had won the lottery.

b. What he$_i$ read in the Tribune suggested that Uncle George$_i$ had won the lottery.

b. What Uncle George$_i$ read in the Tribune suggested that Uncle George$_i$ had won the lottery.

b. What Uncle George$_i$ read in the Tribune suggested that the old bastard$_i$ had won the lottery.

The conditions on AD-antecedent pairs given so far in this chapter have treated pronominalization as if it were optional (i.e. as if all that mattered is that pronouns have antecedents in appropriate positions, without any requirement that one ever use pronouns). However, there are not only cases in which the use of pronouns is optional but cases in which it is obligatory, as illustrated by the following examples adapted from Morrisroe (1969):

(36) a. Michelle hated Dave$_i$ because Dave$_i$/he$_i$ had insulted her.

a'. Dave$_i$'s wife concealed from me that Dave$_i$'s/his$_i$ car was in the repair shop.

b. Dave$_i$ concealed from me that his$_i$/*Dave$_i$'s car was in the repair shop.

Note, by the way, that the obligatoriness or optionality of pronominalization has nothing to do with whether a pronoun is ambiguous as to what its antecedent is—pronominalization can be obligatory even in cases such as (37) in which it creates ambiguity:

(37) Dave$_i$ told Tom$_j$ that he$_{i/j}$/*Dave$_i$/*Tom$_j$ was in trouble.

The obligatoriness of the pronominalization in (36b, 34c) relates not to ADs in general but only to pronouns in the narrow sense: personal pronouns and (as we will see in §11f) reflexive pronouns. The use of other ADs is always optional, even in cases where the antecedent c-commands the AD, as in (38), where *robin* can be substituted for *one* without any loss of acceptability.

(38) The young robin that the old one/robin had pecked was bleeding.

Moreover, there are not, to my knowledge any analogs to (31, 33) in which an AD other than a personal pronoun needs to be excluded on the basis of the AD's relation to its antecedent in a cyclic output.

In the cases that we have adduced so far where a pronoun is required in a particular position in cyclic outputs, there are two coreferential NPs, one occupying an argument position and the other contained in a "lower" argument of the same predicate, in the sense that direct and indirect objects are lower than subjects, and sentential objects are lower than non-sentential objects. It is not possible to state this condition in terms of c-command, because subjects do not obligatorily

pronominalize coreferential NPs in S-modifiers:

(39) a. Before John left the office, he phoned Mary.

b. It was before John/he left the office that John phoned Mary.

Accordingly, we need to introduce a new structural notion to characterize the conditions for obligatory pronominalization, and the definition of "outrank" in (40a) enables us to state the relevant condition on cyclic outputs in the form (40b):

(40) a. The subject of any given predicate outranks all of that predicate's objects and complements and any NPs contained in that predicate's objects and complements; a non-sentential object of a predicate outranks a sentential object of it and any NPs contained in a sentential object.

b. **condition on cyclic outputs**. In any cyclic output, if X is coreferential with Y, X occupies an argument position, and X outranks Y, then Y must be a pronoun with X as antecedent.

Note that, as (40b) is formulated, it excludes not only full NPs that are outranked by a coreferential constituent but also ADs other than pronouns, and thus it excludes anaphoric epithets. It thus correctly excludes the anaphoric epithet in (35a") while allowing the one in (35b"): only in the former case is there a cyclic output (here, one of the form *Uncle George$_i$ read in the Tribune that the old bastard$_i$ had won the lottery*) in which the anaphoric epithet *the old bastard* is outranked by a coreferential NP. Since a NP outranks parts of lower arguments of its clause but does not outrank parts of modifiers of its clause, (40b) correctly predicts that anaphoric epithets have a more restricted distribution than personal pronouns, e.g. they can appear in sentences like (41a) but not in sentences like (41b):

(41) a. After John$_i$ came here yesterday, the bastard$_i$ didn't leave until 1 AM.

b. *John$_i$ thinks that the bastard$_i$ is underpaid.

I will devote the remainder of this section to two kinds of sentences that appear at first to be counterexamples to (40), and to ways in which they can be reconciled with it. Sentences such as (42a) appear to require derivations that include a cyclic output corresponding to (42b), in which the pronoun outranks its antecedent:

(42) a. It was the diamond that John had stolen that he was offering me.

e. Conditions on the use of some other ADs (old 11f)

This section will be concerned with the syntactic constraints on a number of ADs that have not been dealt with in detail so far in this book. Let us begin with **reflexive pronouns**. There is a common misconception that the antecedent of a reflexive pronoun must be the subject of its clause. While such a constraint in fact holds for many languages, it is not true of English, which allows not only a subject as an antecedent, as in (1a), but also a direct object, as in (1b), or in a very restricted class of cases, the object of a preposition, as in (1c):

(1) a. I told John about myself.

b. John asked Mary about herself.

c. I talked to John about himself.

There are many contexts in which a reflexive pronoun is unacceptable if its antecedent is in a higher clause:

(2) a. Hilda said [that she/*herself was angry at us].

a'. I told Fred [that we were angry at him/*himself].

b. [That Hilda is unpopular] doesn't bother her/*herself.

b'. I asked the woman [who loves John] about him/*himself.

However, there are also cases in which a pronoun with an antecedent in a higher clause is optionally reflexive, with quantified NPs such as *no one but himself* or *anybody except herself* being being higher in acceptability than their nonreflexive counterparts when the antecedent of the pronoun is in a higher clause:[18]

(3) a. [That pictures of him(self) are hanging in the post office] doesn't bother Lou.

b. Each student criticized everyone but himself/?him. (Keenan 1988:216)

b'. No student knew whether anyone besides himself/?him got an A.

There likewise are many cases in which a reflexive that is part of a larger NP allows an antecedent within that NP but not outside it, and a reflexive that is outside of a NP does not allow an antecedent within it, though there are also cases in which a reflexive with antecedent in a higher NP is possible:

(4) a. [Sergei's denunciation of himself/*him] shocked everyone.

b. [John's affection for himself/*him] has no limits.

b'. [[John's wife]'s affection for him/*himself] has no limits.

b''. [Mary's view of [John's concern for her/*herself]] selfish.

c. [John's mother] admires him/*himself.

c'. I told [a story about Amy] to ?her/*herself.

(5) a. [John's fascination with [pictures of him(self)]] is embarrassing.

b. Mary couldn't comprehend [John's concern for anyone other than herself/?her].

The restrictions noted in connection with (2) and (4) are quite similar to one another: the reflexive and its antecedent are required to be within a certain domain, rather than one outside it and the other inside it, the domain being a S in the case of (2) and a NP in the case of (4), though elements make it possible for the antecedent to be outside that domain.

Where a reflexive pronoun is possible, its use is often obligatory, i.e. in many of the contexts in which a reflexive pronoun is allowed, a simple personal pronoun or a full NP with the same purported reference is excluded:

(6) a. John$_i$ told Mary about himself$_i$/*him$_i$/*John$_i$.

b. I talked to John$_i$ about himself$_i$/*him$_i$/*John$_i$.

The restriction formulated in §11d(40b) will account for part of this observation if we amend the loose characterization of "outrank" given in §11d(40a) with some stipulation whereby X will outrank Y in *talk to X about Y*: since the first occurrence of *John* in these sentences then outranks the other NP that purports to refer to John, a full NP is excluded in that position. The obligatory reflexivization that is seen in (6) can then be attributed to the constraint on cyclic outputs that requires that there be a pronoun in the position in question, supplemented by a transformation whereby a pronoun that is structurally sufficiently "close" to its antecedent (to a first approximation: it is not separated from it by a S-node or NP-node) is obligatorily made reflexive.

According to the account of reflexive pronouns just sketched, it is structural relations in cyclic outputs that determine whether a constituent must, can, or cannot be a reflexive pronoun, i.e. transformations applying to higher cyclic domains and altering the structural relations

between two NPs cannot affect whether the one must be a reflexive with the other as antecedent. This implication is confirmed by e.g. the fact that when topicalization moves a constituent into topic position, it doesn't eliminate a requirement that that constituent be a reflexive pronoun, nor does it create the possibility for that constituent to be the antecedent of a reflexive pronoun elsewhere in the structure:

(7) a. John believes himself to be underpaid.

b. ?Himself$_i$/*Him$_i$, John$_i$ believes to be underpaid.

c. *John$_i$, he$_i$/himself$_i$ believes to be underpaid.

The possibility of a reflexive within a NP having an antecedent outside the NP is contingent on the N that the reflexive is dependent on:

(8) a. [John's fascination with [pictures of him/himself]] is embarrassing. (= (5a))

a'. [John's responses to [denunciations of him/*himself]] are unconvincing.

The same dependence of acceptability on the choice of the noun is exhibited in sentences in which the antecedent is in a higher S rather than a higher NP:

(9) a. [That pictures of himself/him are hanging in the post office] doesn't bother Lou. (=(3a))

b. [That denunciations of him/*himself were published in Pravda] doesn't bother Sergei.

Picture belongs to a class of nouns (generally referred to as **picture nouns**, following Warshawsky 1965) that allow their "objects" to take a reflexive form under less stringent conditions on the location of the antecedent than those usually in force:[19]

(10) a. John saw a description of himself/him.

a'. John saw a letter to him/*himself.

b. Mary collects portraits of herself/??her.

b'. Mary collects invitations to ?her/*herself.

A reflexive with an antecedent outside of the given NP is most natural when the NP is indefinite and the picture noun has no "subject":

(11) a. ?John saw the description of himself.

a'. ??John saw a description of himself by Ann.

a". ???John saw a description by Ann of himself.

a"'. *John saw Ann's description of himself.

The unacceptability of examples in which a reflexive in a NP with a subject has an antecedent outside that NP can be interpreted as a preference for the reflexive to have its antecedent within as small a domain as possible: in this case the subject of the NP (*Ann* in (11a'-a"')) takes priority over anything outside the NP as a possible antecedent for the reflexive.

The relationship of the reciprocal pronoun *each other* to its antecedent is subject to constraints similar to those observed with reflexives:

(12) a. The boys asked me about each other.

b. I asked the boys about each other.

c. *[The mothers of the boys] insulted each other.

d. I showed the boys pictures of each other.

(13) a. [The prisoners' denunciations of each other] shocked me.

a'. *The prisoners were shocked at [the warden's denunciations of each other]

b. [Matisse's and Derain's portraits of each other] are on display in the Tate Gallery.

b'. *[Matisse's and Derain's wives] had affairs with each other.

b". Matisse and Derain had affairs with each other's wives.

However, the conditions under which a reflexive can have an antecedent in a higher S do not generally carry over to reciprocals:

(14) a. *That pictures of each other are hanging in the post office doesn't bother Tom and Lucy.

b. *Neither candidate knew whether anyone besides each other had spread lies about him.

c. Tom thinks that anyone but himself should be treated with contempt.

c'.*Tom and Dick think that anyone but each other should be treated with respect.

(intended reading: Tom thinks that anyone than Dick should be treated with respect, and Dick thinks that anyone but Tom should be treated with respect)

Another difference between reciprocal and reflexive pronouns is that reciprocals sometimes are ambiguous as to whether the antecedent is a clause-mate of or in a higher S than the pronoun.[20] For example, (15a) is ambiguous between (15b), where the antecedent is the understood subject of the complement S, and (15b'), where the antecedent is the main clause subject:

(15) a. Reagan and Mondale claimed to have caused each other trouble.

b. Reagan and Mondale claimed ((each: x in {Reagan, Mondale})(x caused the other trouble)), i.e. both claimed that each caused the other trouble. (Reagan: "Walter, you and I caused each other trouble"; Mondale: "That's right, Ron, we caused each other trouble")

b'. (each: x in {Reagan, Mondale})(x claimed (x caused the other trouble)), i.e. each claimed that he caused the other trouble. (Reagan: "I caused you trouble, Walter"; Mondale: "And I caused you trouble, Ron")

Under the analysis that will be suggested in §11f, in which the *each* of *each other* is the ordinary quantifier *each*, this ambiguity is an ambiguity as to the scope of *each* and reflects the fact that quantifiers in a subordinate S often are ambiguous as to whether that S or a superordinate one is the scope. Since a reflexive pronoun does not include a quantifier in its meaning, it does not in itself create possibilities for scope ambiguity. The use of *each other* then should reflect two separate sets of constraints: constraints on the anaphoric relation between *other* and its antecedent, and constraints on what can be the scope of a quantifier such as *each*. Thus, we cannot conclude with any certainty that reciprocals and reflexives are subject to different anaphoric restrictions unless we can rule out the possibility that examples such as (14a,b,c') are bad for reasons that are not purely in the realm of anaphora.

There is one class of cases in which it appears that a reciprocal is possible but a reflexive is not, namely that in which the reciprocal is a genitive:

(16) a. Max and Rita plagiarized each other's work.

a'. Max$_i$ sold his$_i$/*himself's car.

However, this difference is more plausibly regarded as a matter of morphology rather than of syntax: since English (unlike, say, Swedish or Russian) does not draw a distinction between reflexive and nonreflexive personal pronouns, *his* in (16a') can be treated as reflexive the same way that *you* in *He loves you* is treated as accusative, even though there is no overt difference between an accusative *you* and a nominative *you*.

Another type of AD that is subject to different constraints than personal pronouns are is **anaphoric epithets (AEs)**:

(17) a. John borrowed $100 from me, and the bastard never paid me back.

b. *Sam said that the son of a bitch was mad at me.

c. I won't talk to John until the bastard apologizes to me.

c'. ?John won't talk to you until the bastard feels like it.

d. When John was here, I told the bastard what I thought of him.

d'. ?When the bastard was here, I told John what I thought of him.

d". When John was here, the bastard insulted me.

d"'. ??When the bastard was here, John insulted me.

d"". Although I've never met the son of a bitch, I have a very low opinion of Schwartz.

e. *George III collected portraits of the bastard.

e'. George III's nephew collected portraits of the bastard.

e". Every portrait of George III is a poor likeness of the bastard

e"'. People who knew George III couldn't stand the bastard.

f. That John wasn't invited didn't bother the son of a bitch.

f'. ??That the son of a bitch wasn't invited didn't bother John.

The least acceptable examples in (17) are in general those in which the antecedent c-command the AE (17b, c', d"', e), and those examples are ones in which the antecedent outranks the AE a would thus require that a pronoun occupy the position that here is occupied by an AE. However, the fact that (17f') is worse than (16c') remains unaccounted for.

•add material on logophoricity, empathy?•

NOTES

cible, but (5b) would still be odd in virtue of the peculiarity of conjoining two sentences that do not really add up to a coherent whole.

12. See Fauconnier 1985 for a highly perceptive account of this phenomenon in these terms, and of its surprisingly broad ramifications.

13. The oddness of forwards pronominalization in (3a) is noteworthy. Kuno (1972) argues that in logophoric clauses, i.e. clauses that represent person's thoughts or words, a pronoun rather than a full NP must be used in references to the person whose thoughts or words are represented. Note that there is no oddity in parallel sentences in which the clause in question does not represent the person's thoughts:

That John had lost was concealed from him.

That John is so kind endears him to me.

Kuno's proposal also accounts for the oddity of §11b(19b):

*Realizing that John was incompetent seemed to him to be bothering Mary.

Since the complement of *seem to him* expresses "his" thoughts, a pronoun is required any place in the complement that "he" is referred to. Note that this analysis defuses Ross's explanation of the oddity of:

*Realizing that John was incompetent didn't bother him.

Under Kuno's approach it is immaterial what the underlying subject of *realize* is, as long as *realizing that John was incompetent* is in a context where it expresses John's thoughts.

14. I sidestep here the important question of how "S" must be interpreted in this definition, i.e. which constituents that are Ss on only some of the dimensions of S-hood discussed in chapter 7 are relevant to identifying "the lowest S-node such that ...".

15. Or at least, it is generally rated as acceptable if *John* is destressed:

His mother loves John.

More generally, when a pronoun precedes its antecedent, the antecedent has to be destressed.

16. The "c" of "c-command" stands for "constituent". "S-command" and "c-command" are two of an open-ended class of notions of "command" that can be defined by different choices of the condition that characterizes a "bounding node". An exhaustive taxonomy of such relations is given in Barker and Pullum (1990).

17. I assume here the structures argued for in chapter 13, in which a restrictive relative clause is an adjunct of an N'.

18. Cantrall (1972) argues that the use of reflexives is favored by interpretations in which the judgement of identity between referents of pronoun and antecedent reflects the point of view of the person referred to. Such a distinction is fairly clear in such examples as:

A huge portrait of himself is hanging in Reagan's/*Lincoln's bedroom.

The identity of the subject of the portrait here can reflect Reagan's point of view but not Lincoln's. This hypothesis provides an explanation of why picture nouns provide a particularly congenial environment for "long-distance reflexives": it is easy to impose on a depiction the viewpoint of a particular viewer. Keenan (1988) notes a number of other kinds of expressions besides quantified NPs within which a reflexive readily allows an antecedent in a higher clause, e.g.

Max considers Susan more qualified than anyone but himself.

19. A further restriction that comes into the picture here is that kinship nouns such as *friend* require that a pronoun "object" be in the genitive form: *a friend of his*, with the consequence that in examples such as the following, neither a simple nor a reflexive form is normal:

i. [John's quarrels with [friends of *him/*himself]] disgust me.

i'. [That friends of *himself/*him have been hanged] doesn't bother Lou.

The genitive form is usually preferred, though not obligatory, when the "object" is a full NP: *a friend of that woman('s)*.

20. This point is made in Lebeaux (1983). The existence of interpretations like (15b) appears to have been pointed out first by Sampson (1980:186).

Curly brackets, in (14b-b'), are a standard device for specifying a finite set by listing its members: {Reagan, Mondale} is the two-member set whose members are Reagan and Mondale.

21. The notion of "noun by which one standardly refers to X" has to be explicated in terms of the notion of "basic level of a taxonomy" (Berlin 1978). "Car" is a basic-level concept, whereas superordinate concepts such as "motor vehicle" and subordinate concepts such as "station wagon" and "Chevrolet" are not. Thus, in the French examples, it should be immaterial whether there is a

c. Islands; generality of the constraints

The various constraints discussed in §15b all have the effect of "isolating" one part of a syntactic structure from the rest of the structure, in the sense that movement of material out of the one part of the structure and into some other part is excluded. (Later in this section, we will take up the question of whether this "isolation" of one part of the structure is more general than just this constraint on movement, e.g. whether other kinds of interaction between material inside and material outside the given part of the structure are also excluded.) For example, the CNPC says that the S of a [Det N S] combination is "isolated" from the rest of the sentence in which it occurs. Ross introduced the term **island** to refer to a part of a sentence that is "isolated from" the rest of the sentence, in the sense that this section will attempt to clarify.

Hitherto, we have discussed Ross's constraints solely in connection with movement transformations. Let us now consider whether the parts of a sentence that are isolated with regard to movement transformations are also isolated with regard to other types of transformations. Once again, to be sure that a general constraint is responsible for the anomaly of various examples, rather than just a restriction on the configuration to which a particular transformation operates, it will be of particular importance to consider transformations that "operate over a variable", i.e. transformations which do not require that the elements involved in the application of the transformation stand in one fixed structural relation to one another but rather allow its application in an open-ended class of cases, where in particular, relevant elements can be arbitrarily many Ss higher or lower in the structure than other relevant elements.

The following gross "types" of transformations seem to include particular rules that operate over a variable. (i) Deletion transformations. Example: deletion of the compared element of a *than*-clause under identity with the compared adjective of the host S (to be discussed in chapter 20). The deleted adjective can be arbitrarily deep in the *than*-clause:

(1) a. Fred is fatter than I remember your brother being Ø.

b. Fred is fatter than anyone would have thought that it might turn out that a resident of Oregon could be Ø.

(ii) Copying transformations. Example: **Left Dislocation**, which puts a copy of a NP at the

beginning of a S and replaces the original by the corresponding personal pronoun. The copied constituent can be arbitrarily deep in the sentence:

(2) a. Your brother, I don't think there's much chance that anyone would be so stupid as to pick a fight with him.

b. Reagan, I wouldn't trust anyone who goes around trying to convince people to vote for him.

(iii) "Change" transformations, in which one element changes its form under the influence of another. Example: the *same-any* conversion transformation, to be discussed in §17a, which replaces a *same* by *any* if it is commanded by a negation. The negation can be arbitrarily much higher in the structure than the affected *same*

(3) a. John doesn't think it's likely that any college will accept him.

b. Many people won't admit that they recognize the possibility that there is a chance that they have forgotten anything.

A fourth type of transformation, namely insertion transformations, such as *Do*-support, does not include any clearly unbounded transformations that I know of; I will accordingly ignore that class of transformations in the remainder of this section.

Taking deletion of compared constituents, Left Dislocation, and *same-any* conversion as typical of unbounded deletion, copying, and change transformations, respectively, let us construct examples to determine which, if any, of them conform to the Ross constraints on movement. First, deletion of compared constituents, illustrating deletion transformations:

(4) a. They have more applicants than I would expect that (*they're going to open a new factory and) they have Ø jobs.

a'. The linguistics department had more applicants than the university has Ø fellowships or the housing office has Ø rooms.

b. Tom owns more jackets than I have just met ??a/*the man who owns shirts.

b'. ??George is fatter than someone is spreading a rumor that Tom is Ø.

These examples provide evidence that deletion of compared constituents does respect both the CSC and the CNPC. Next, let us look at Left-dislocation, illustrating copying transformations:

(5) a. Your brother, someone yelled obscenities at him and ran away.

b. Your brother, I've just been talking to a woman who says she beat him at arm wrestling.

These examples suggest that Left-dislocation does not respect the CSC or the CNPC: neither the coordinate V' of (5a) nor the complex NP of (5b) seems to pose any obstacle to its application.

We turn finally to *Some-any* conversion, illustrating change transformations. It is easy to construct examples showing that *Some-any* conversion can apply into complex NPs with an indefinite article (including the zero plural indefinite article) but not complex NPs with a definite article:

(6) a. I've never read a/*the book by Chomsky that anyone wanted to nominate for a Pulitzer Prize.

a'. With a voice like yours, you shouldn't sing songs that go above A^b.

Making up examples to test whether it conforms to the CSC is complicated by the fact that negation interacts with the selection of *and* or *or* as the conjunction. For example, while one might offer examples like (7a) as evidence that *Some-any* conversion obeys the CSC, that conclusion is premature, since Across-the-board *Some-any* conversion, which ought then to be possible, is even worse (7b):

(7) a. ??I didn't say that [Fred had quit and anyone that you know had been named his replacement].

a'. *I didn't say that anyone had quit and anyone had been hired. (as negation of "I said that someone had quit and someone had been hired")

By contrast, when the conjunction is *or*, *Some-any* conversion can apply irrespective of whether its effect is in one conjunct or both:

(8) a. I didn't ask Fred to make punch or buy any beer.

a'. I didn't say that anyone had quit or anyone had been hired.

Seuren (1974) and LeGrand (1974) have proposed that when Conjunction-reduction applies to negative Ss conjoined by *and*, the *and* is converted into *or*; according to that proposal, (8a) could be given the same deep structure as *I didn't ask Fred to make punch and I didn't ask him to buy any beer*, in which case the CSC would be irrelevant to examples as in (8): *Some-any* conversion would be applying in the individual conjuncts, not in a structure in which a coordinate structure

was in the scope of a negation. Thus, to test whether the CSC constrains the application of *Some-any* conversion, it is necessary to construct examples that could not be derived from a structure such as Seuren and LeGrand proposed for examples as in (8), and in the examples that I have constructed, it doesn't seem to matter much whether *Some-any* conversion affects all or only one of the conjuncts:

(9) a. *I didn't ask Mary to bring any beer but bring a pitcher of lemonade too.

a'. *I didn't ask Mary to bring any beer but bring any soft drinks too.

b. ?I wouldn't have thought that Franz Schubert and any librettist would have collaborated on such a worthless project.

b'. I wouldn't have thought that any composer and any librettist would have collaborated on such a worthless project.

I thus know of no clear cases in which the CSC can be held responsible for the behavior of instances of *some* in coordinate structures.

This minuscule body of facts suggests that Comparative Deletion (and perhaps, deletion transformations in general) is subject to the Ross constraints and that Left Dislocation and perhaps *Some-any* conversion (perhaps, copying and change transformations in general) are not subject to them. It should be noted that not all transformations fit clearly into any of the categories recognized here. For example, it is not obvious whether Right-node-raising should be regarded as a movement transformation, as a deletion transformation, as both simultaneously, or as neither. In §16a, I will take up in some detail the surface structure of sentences with Right-node-raising and will come to conclusions that imply that it is neither a movement nor a deletion.

While not strictly speaking taken in under Ross's conception of "island", one other thing to which the term island has sometimes been applied should be at least mentioned here. Postal (1969) has argued that anaphoric relations between a part of a (morphologically or semantically) complex N, V, or A and anything outside the N, V, or A are systematically excluded, and has accordingly spoken of Ns, Vs, and As as **anaphoric islands**. For example, while the anaphoric relations in (10a, b, c) are normal, if an expression containing the antecedent of an AD is replaced by a single word that it paraphrases, thus creating an anaphoric relation between a semantic or

morphological part of the word and something outside of the word, the result is usually deviant:

(10) a. A child whose parents are dead usually misses them.

a'. *An orphan usually misses them.

b. Most people who eat artichokes buy a lot of them.

b'. ?Most artichoke-eaters buy a lot of them.

c. Many people who work often do so unwillingly.

c'. ??Many workers often do so unwillingly.

Though anaphoric relations between semantic constituents of a word and constituents outside the word are generally completely unacceptable (e.g. (10a')), relations involving morphological constituents of a word are often sufficiently normal that it is not rare for them to be produced spontaneously, though morphological relatedness is far from a sufficient condition for the acceptability of the forms in question:

(11) a. I won't reply to your comments, since they don't require one (= a reply).

b. *Fred hates to cook, so he's hired one (= a cook).

There is an important class of cases in which a morphological constituent that by Postal's anaphoric island principle is prevented from standing in an anaphoric relation *per se* can nonetheless participate in another kind of syntactic relation. Specifically, Postal points out that the proper name that is a morphological constituent of such **pseudo-adjectives** (Postal's term) as *American* and *Japanese* can serve as the controller for Equi-NP-deletion (12a) even though it is still not available as the antecedent of a pronoun (12b):

(12) a. An American attempt [Ø to invade Cuba] has been expected for years.

b. *Any American attempt to invade Cuba would generate support for its/her enemies.

Nicolas Ruwet (personal communication) points out that pseudo-adjectives also count as subjects for the purposes of the SpSC, i.e. while *decisive*, which is not a subject, does not prevent a reciprocal pronoun within the nominalization from having an antecedent outside of the nominalization in (13), a pseudo-adjective such as *French* does:

(13) The British and the Germans celebrate decisive/*French victories over each other.

d. Parasitic gaps

Sentences as in (1) involve two gaps that correspond to a single moved item (examples from Ross 1967 and Engdahl 1983):

(1) a. Which articles$_i$ did John file Ø$_i$ without reading Ø$_i$?

b. The curtain which$_i$ Fred tore Ø$_i$ in rolling Ø$_i$ up was a gift from my Aunt Priscilla.

c. These papers$_i$ were hard for us to file Ø$_i$ without first reading Ø$_i$.

However, these double gaps are quite different from those that result from across-the-board application of a movement rule, where the gaps are in different conjuncts of a coordinate structure (unlike (1), where there is no coordination) and every conjunct is required to have a gap (2):

(2) a. Which articles$_i$ did John file Ø$_i$ but not read Ø$_i$/*them$_i$?

b. This book$_i$ is easy to read Ø$_i$ and write a report on Ø$_i$/*it$_i$.

By contrast, the sentences in (1) have counterparts in which there is only a single gap (3):

(3) a. Which articles$_i$ did John file Ø$_i$ without reading them$_i$?

b. The curtain which$_i$ Fred tore Ø$_i$ in rolling it$_i$ up was a gift from my Aunt Priscilla.

c. These papers$_i$ were hard for us to file Ø$_i$ without first reading them$_i$.

Note, though, that if there is only a single gap, it has to be the one indicated in (3) and not the other one:

(4) a. *Which articles$_i$ did John file them$_i$ without reading Ø$_i$?

b. *The curtain which$_i$ Fred tore it$_i$ in rolling Ø$_i$ up was a gift from my Aunt Priscilla.

c. *These papers$_i$ were hard for us to file them$_i$ without first reading Ø$_i$.

It is because of this asymmetry between the gaps in sentences as in (1) that Taraldsen (1979) chose to speak of one gap as being **parasitic** on the other: the examples in (3) have a gap such as would result from ordinary Wh-movement or *Tough*-movement, and those in (1) have an additional gap that is parasitic on the "normal" gap and in many cases (as in (4)) not possible unless there is also a corresponding normal gap.

In the examples in (1), the normal gap precedes the parasitic gap. However, there are also instances in which a parasitic gap precedes the normal gap that licenses it (examples adapted from Engdahl 1983):

(5) a. Which boy$_i$ did Mary's talking to $\emptyset_i$ bother $\emptyset_i$ the most?

a'. Which boy$_i$ did Mary's talking to Roger bother $\emptyset_i$ the most?

a". ??Which boy$_i$ did Mary's talking to $\emptyset_i$ bother Angela the most?

b. This is a book$_i$ that no one who has read $\emptyset_i$ would give $\emptyset_i$ to his mother.

b'. This is a book$_i$ that no one who has read *Portnoy's Complaint* would give $\emptyset_i$ to his mother.

b". *This is a book$_i$ that no one who has read $\emptyset_i$ would give flowers to his mother.

To avoid an extraneous factor that would otherwise lower the acceptability of (5a', b'), these examples have been chosen in a way that makes them different from the examples relating to "forwards" parasitic gaps given in (3-4), namely that the gap has been replaced not by a pronoun having the same reference as the gap but by a full NP differing in reference. The reason for the change is that with a pronoun in the position in question, the examples would exhibit the weak crossover phenomenon (Postal 1971), in which, under conditions that will not be stated here, the acceptability of a sentence is lowered if a moved item "crosses" an AD of which it is the antecedent, as where *which boy* "crosses over" *him* in the step of the derivation of (6a) in which Wh-movement applies to a structure roughly as in (6b):

(6) a. ??Which boy$_i$ did Mary's talking to him$_i$ bother $\emptyset_i$ the most?

b. Q [[Mary's talking to him$_i$] bothered which boy$_i$ the most]

It must indeed be a gap that licenses a parasitic gap. For example, in multiple-Wh questions, there can be a parasitic gap corresponding to the moved Wh-expression, but not one corresponding to a Wh-expression that remains "in situ":[a]

(7) a. Which compositions$_i$ did John tell which students$_j$ to study the scores of $\emptyset_i$ before listening to recordings of $\emptyset_i$?

b. Which compositions$_i$ did John tell which students$_j$ to study the scores of $\emptyset_i$ after correcting exercises by them$_j$/*$\emptyset_j$?

It appears to be only the gaps created by movement rules and not also by deletion rules that can license parasitic gaps; for example, the gap left by deletion of a compared element or by Super-Equi does not license a parasitic gap:

(8) a. *John drinks as much coffee as Mary drinks $\emptyset$ whenever Bill drinks $\emptyset$.

a'. John drinks as much coffee as Mary drinks $\emptyset$ whenever Bill drinks that much coffee.

b. John$_i$ hinted [that it was likely [that [$\emptyset_i$ buying himself a new hat] would prove beneficial to him$_i$/*$\emptyset_i$]].

Whether a parasitic gap is possible depends on what is responsible for the gap on which it is to be parasitic. In the examples given so far, the gaps that license parasitic gaps are created by Wh-movement and *Tough*-movement. Among the other movement rules that can give rise to parasitic gaps are Topicalization and Heavy Constituent Shift:

(9) a. Several$_i$ of the reports John filed $\emptyset_i$ without reading$_i$ $\emptyset_i$.

b. John threw $\emptyset_i$ in the wastebasket without even showing $\emptyset_i$ to his assistant any reports$_i$ that were full of statistics.

Some that cannot are Passive and Raising:

(10) a. John$_i$ was arrested $\emptyset_i$ by the police before Mary could find him$_i$/*$\emptyset_i$.

b. We believe John$_i$ [$\emptyset_i$ to have read the letter before we ran into him$_i$/*$\emptyset_i$].

b'. John$_i$ seems [$\emptyset_i$ to have read the letter before we ran into him$_i$/*$\emptyset_i$].

If it were not for HCS, we could offer the generalization that unbounded movements can give rise to parasitic gaps while bounded movements cannot. However, the status of HCS as a bounded transformation has in fact been disputed by Andrews (1975:112-13) and Gazdar (1981: 176-77). Andrews notes that the examples commonly given in arguing that HCS is bounded can be excluded on other grounds (e.g. (11a) violates the Sentential Subject Condition) and that examples where there is long-distance HCS but no violation of the sentential subject constraint are only mildly odd (11b); indeed, some such examples (such as (11c), taken from Witten 1972) sound perfectly normal:

(11) a. *That it was obvious is not true that Bob was lying.

b. ?Bill said that it would be difficult in his memorandum to get the project funded.

c. I have wanted to know for many years exactly what happened to Rosa Luxemburg.

I will accordingly tentatively retract my previous claim that HCS is bounded and take unbounded movements to be precisely the transformations that yield gaps which can license parasitic gaps.

The possibility of a parasitic gap also depends on where it is in relation to the gap that

licenses it. One general restriction is that the parasitic gap must be c-commanded by (the derived position of) the moved item. In the case of Wh-movement, this restriction duplicates a semantic restriction that is imposed by interrogative and relative constructions, since those constructions involve a logical variable bound by an operator whose scope is the material c-commanded by the Wh-moved item, e.g. (6a) has a logical structure roughly as in (12a), and accordingly, a sentence like (12b) would have an incoherent logical form like (12b'), in which an occurrence of the variable was outside the scope of the operator that binds it:

(12) a. (which boy)$_x$ ((Mary's talking to x) bothered x the most).

b. *(Which boy$_i$ (Mary's talking to $\emptyset_i$) bothered Roger the most) amused $\emptyset_i$.

b'. *[(which boy)$_x$ ((Mary's talking to x) bothered Roger the most)] amused x.

However, analogs to (12b) in which Topicalization moves a NP with a constant reference are equally bad:

(13) That (Fred$_i$ Mary regards $\emptyset_i$ with contempt) is obvious to him$_i$/*$\emptyset_i$.

One case in which syntactic constructions that normally allow parasitic gaps do not (discussed at length in Engdahl 1983, Sag 1983, and Chomsky 1986) is that in which the "normal" gap is a subject:

(14) a. Who$_i$ [$\emptyset_i$ left before you could say goodbye to him$_i$/*$\emptyset_i$]?

a'. Which guest$_i$ did Karen say $\emptyset_i$ had left before she could say goodbye to him$_i$/*$\emptyset_i$?

Some subject gaps nonetheless do license parasitic gaps:

(15) Which emperor$_i$ did Brutus imply $\emptyset_i$ was senile while ostensibly praising $\emptyset_i$?

Note, however, a difference in the constituent structure between (15) and (14a'): the adverbial clause containing the parasitic gap modifies the complement S in (14a') (thus, the S whose subject provides the normal gap), while in (15) it modifies the main S, whose subject is not the source of the normal gap. This difference conforms to the generalization that a normal gap cannot license a parasitic gap that it c-commands.

The latter hypothesis implies that an object gap should not be able to license a parasitic gap in the same V' but a gap within an object should; this is in fact the case:

(16) a. *the slave who$_i$ the emperor gave $\emptyset_i$ to a relative of $\emptyset_i$

a'. ?the slave who$_i$ the emperor told a story about $\emptyset_i$ to a relative of$_i$

Why would parasitic gaps be subject to such a condition? An answer may emerge from the condition given in §11d for obligatoriness of pronominalization. In the cases where parasitic gaps are excluded, the parasitic gap is in a position where a NP that is coreferential with a NP in the position of the "normal" gap would have to be a pronoun with the latter as its antecedent:

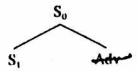
(17) a. John$_i$ left before I could say goodbye to him$_i$/*John$_i$.

b. The emperor gave Didius$_i$ to a relative of his$_i$/??Didius$_i$.

Engdahl (1983) suggests within a framework quite different from that of this book what would amount to a restriction excluding "obligatory pronouns" from being turned into parasitic gaps; such a hypothesis would add substance to the notion of "obligatory pronominalization", since it would rule out not only "full" NPs in the cases in question but also a type of empty constituent that in many cases is virtually interchangeable with a pronoun.

EXERCISES

1. Use the CSC to determine whether each of the following is a coordinate structure:
   a. S_1 but S_2
   b. S_1 unless S_2
   c. S_1 so S_2 (e.g., *There was no beer left, so I bought some more*)
   d. from NP_1 to NP_2 (as in *This road runs from Boston to Albany*)
   e. The A-er S_1, the A-er S_2 (*The more cigarettes Sam smokes, the sicker he gets*)
2. Determine whether each of the following transformations is bounded:
   a. Super-Equi
   b. Preposing of $\bar{A}$ + *though* in such sentences as *Fond of his children though John is, he never gives them presents.*
   c. *Tough*-movement
   d. The movement of $\bar{P}$s that was discussed in chapter 11 in connection with such examples as *Near him, John saw a snake.*
   e. Conjunction reduction
3. Pick any two of the Ross constraints on transformations and determine whether each of the transformations in exercise 2 conforms to them.
4. Construct the relevant examples to test whether the constituent moved to the right by ~~Heavy-NP-shift~~, as sketched in §15b, is always a NP.
5. In multiple-WH questions (e.g., *What did John say to whom?*), only one of the interrogative expressions moves. Determine whether the interrogative expression that **does not** move obeys any of the Ross constraints.
6. The discussion of the Right Roof Constraint in §15b did not make clear how it applies to a S involving a S-modifier, i.e., whether in a structure of the following form the constraint allows material from S_1 to be moved to the end of S_0 (thus, placed after the ~~Adv~~) or only allows it to be moved to a position within S_1:



Make up examples to test which of these two interpretations should be placed on the constraint. In doing so, take account of the difficulty of telling whether a S-final constituent is a S-modifier or a $\bar{V}$-modifier in surface structure, i.e., try to choose your examples so that ~~the adverb~~ has to be taken to be a surface S-modifier.

7. a. In the discussion of the CNPC, no account was taken of what the determiner of the NP was. Make up examples that will test whether the difference between *the* and *a* makes any difference in the extent to which violations of the CNPC are unacceptable.
   b. Make up examples that will show whether a NP that contains a reduced nonfinite S (e.g., *a way of reducing inflation; an attempt to victimize us; a reason for moving to the south*) should count as a complex NP for the purposes of the CNPC.
8. Construct examples that will determine whether NPs like the underlined one should count as subjects of NPs for the purposes of the SpSC:

   the denunciation of Stalin by Khrushchev

9. The following example appears at first to be a counterexample to the Left Branch Condition:

   How many did you buy of the sausages?

Show how it can be analyzed so as not to conflict with the condition.

10. Languages (like English) in which a relative clause follows its head commonly allow extraposition of relative clauses, while languages (like Chinese and Japanese) in which relative clauses precede the head never allow extraposition of relative clauses. Which of Ross's constraints could be held to be violated by extraposition of relative clauses in the latter but not the former languages? Make clear how the relevant notions would need to be interpreted in order for extraposition of relative clauses to violate that constraint in languages like Chinese.

11. For each of the following sentences, determine whether it involves a parasitic gap; if it does, determine which gap is parasitic on which other gap and whether the parasitic gap conforms to the restrictions given in §15d:

   a. This is a book which, if you don't know about Ø, I recommend Ø very highly.

   b. It's the only law that ignorance of Ø excuses violations of Ø.

   c. <She was> now approaching the end of her life, as Sandy well knew Ø but tried not to think about Ø. (Pohl, *Homegoing*, p. 4)

   d. Which reports$_i$ did Mary decide before reading Ø$_i$ to tell her assistant to distribute Ø$_i$?

   e. It's something$_i$ I don't care enough about Ø$_i$ to do anything about Ø$_i$.

   f. The contract which I want to peruse Ø$_i$ before damaging Ø$_i$ while filing$_i$ Ø$_i$ is written on Peruvian papyrus. (from Ross 1967)

If there are more than two gaps, be careful to make clear what exactly is parasitic on what. (Can a parasitic gap be parasitic on another parasitic gap?) If the sentence involves a construction whose surface constituent structure has not been established, say what the constituent structure would have to be for it to conform to the generalization that parasitic gaps not be c-commanded by their licensers.

12. Using the following examples from Chomsky 1986:58 and any other relevant examples, say how, if at all, the CNPC applies to parasitic gaps.

   i. He's a man that$_i$ anyone who talks to Ø$_i$ usually likes Ø$_i$.

   ii. He's a man that$_i$ anyone who tells people to talk to Ø$_i$ usually likes Ø$_i$.

   iii. *He's a man that$_i$ anyone who meets people who talk to Ø$_i$ usually likes Ø$_i$.

13. It was argued in §9c that *as well as* is a coordinating conjunction. Determine whether the

apparent across-the-boards extraction of examples like the following could be taken instead to involve instead a parasitic gap:

How many presidents does John own portraits of Ø as well as books about Ø?

If your answer is positive, say whether it affects the case made above that *as well as* is a coordinating conjunction.

NOTES

1. In the approaches to syntax found in Chomsky's works since the middle 1970s, in which the output of a movement transformation is assumed to contain a **trace**, i.e. a phonetically null AD having the moved constituent as antecedent, the constraint has generally been formulated (e.g. Chomsky and Lasnik 1977:456) as excluding the surface configuration [Comp [trace V']] and has accordingly often been referred to as the ***that*-trace filter**. See Maling and Zaenen (1978) for a critique of Chomsky and Lasnik's account of the unacceptability of such examples as (18: *that*).

2. On the relationship between whether a language has this surface constraint and whether it allows omission of subject pronouns, see Perlmutter (1970), Maling and Zaenen (1982), Huang (1984). The constraint must be formulated so as not to exclude relative clauses of the form *that* V'. The constraint against extraction of subjects from Ss with a non-zero complementizer is proposed in Bresnan (1972) under the name **Fixed Subject Condition**.

3. Not all languages share with English the property that extraposition of complements and of relative clauses is bounded: Subbarao (1984) has noted that Hindi has acceptable analogs to sentences like (23a', 24a'), e.g.

yah kahnaa galat hai [ki bhaarat meM sabhii log amiir hote haiM].
this say-Inf wrong is that India in all people rich be-Ptcpl$_{mpl}$ are
*To say it is wrong that in India all the people are rich. (Subbarao, p. 8)

un jhuuThoM ko dohraanaa buraa hai, jo raam ne tumheM bataaye the.
those$_{obl}$ lies$_{obl}$ Dat repeat-Inf bad$_{msg}$ is which Ram Erg you-Dat told$_{mpl}$ was$_{mpl}$
*To repeat the lies$_i$ is bad that$_i$ Raam told you.

The status of HCS as a bounded transformation has been disputed by Andrews (1975:112-13) and Gazdar (1981: 176-77) on grounds that will be taken up in §15d.

4. This statement will have to be revised so as to provide for unbounded deletions and changes as well as for unbounded movements.

5. Chomsky's statement of the SpSC distinguishes between zero subjects that count for the purposes of the condition and zero subjects that it ignores. A zero subject controlled by the 'affected' main clause constituent is ignored, though one controlled by anything else is not:

i. Reagan and Mondale promised Dan Rather [Ø not to cause each other any trouble].

ii. *Reagan and Mondale persuaded Dick Tuck [Ø to cause each other some trouble].

Note that (i) allows not only the (here, irrelevant) interpretation in which the Ø is the antecedent of *each other* but also one in which *Reagan and Mondale* is the antecedent (meaning: Reagan promised Rather not to cause Mondale any trouble, and Mondale promised Rather not to cause Reagan any trouble).

6. As can be seen from (7a), a gap can license more than one parasitic gap.

13 Relative clauses

a. Restrictive relative clauses

Restrictive relative clauses in English can take any of three surface forms, leaving aside for the moment the reduced relative clauses that were taken up in §12b and the infinitival relatives that will be taken up later in this section. In the first of these forms (henceforth, the **Wh-relative**), the relative clause consists of a **relative expression** (either a relative pronoun such as *who* or *which* or a more complex expression such as *for which* or *during whose reign*, in which a relative pronoun is combined with other material) followed by a truncated S, i.e. something having the general form of a S except for lacking a constituent corresponding to the relative expression:

(1) a. the person who I talked to

b. the book which I was reading

c. the place where I found the money

d. the day when I went to the zoo

e. the reason why I left early

f. The woman who John went to the concert with

(2) a. the woman with whom John went to the concert

b. the conditions under which I'll sign the contract

c. the pope during whose reign America was discovered

d. the president despite whose opposition the Taft-Hartley Act was passed

e. the way in which he tricked me

The second form that a restrictive relative can take (henceforth, the ***that*-relative**) is a form in which it is introduced by *that*:

(3) a. the person that I talked to

b. the book that I was reading

c. the place that I found the money

d. the day that I went to the zoo

e. the reason that I left early

f. The woman that John went to the concert with

That is not simply a substitute for a relative pronoun, since cannot replace a relative pronoun in

relative expressions that consist of more than a relative pronoun:

(4) a. *the woman with that John went to the concert

b. *the conditions under that I'll sign the contract

c. *the pope during that's reign America was discovered

d. *the president despite that's opposition the Taft-Hartley Act was passed

e. *the way in that he tricked me

Moreover, subject to some exceptions such as *in which* in (2e), it cannot replace a complex relative expression either:

(5) a. *the woman that John went to the concert

b. *the conditions that I'll sign the contract

c. *the pope that America was discovered

d. *the president that the Taft-Hartley Act was passed

e. the way that he tricked me

The third form for restrictive relatives (henceforth, the **bare relative**) is one in which neither a relative pronoun nor a *that* appears:

(6) a. the person I talked to

b. the book I was reading

c. the place I found the money

d. the day I went to the zoo

e. the reason I left early

f. the woman John went to the concert with

g. the way he tricked me

In all cases where a bare relative is possible, a corresponding *that*-relative is also possible, though (as will be shown below) not vice-versa.

It will emerge later that bare relatives are subject to a number of restrictions, relating both to external syntax and to internal syntax, that do not apply to Wh-relatives and *that*-relatives. The latter two forms, however, appear to be identical with regard to external syntax: Wh- and *that*-relatives can be mixed freely when restrictive relatives are stacked (7a-a''') or conjoined (7b-b'''), and each can be extraposed under apparently the same conditions

(7c-c'):

(7) a. the book which I bought which Ann had recommended

a'. the book that I bought that Ann had recommended.

a''. the book which I bought that Ann had recommended

a'''. the book that I bought which Ann had recommended

b. all the books which Ann praised and which Lester ridiculed

b'. all the books that Ann praised and that Lester ridiculed

b''. all the books which Ann praised and that Lester ridiculed

b'''. all the books that Ann praised and which Lester ridiculed

c. A book appeared which all the critics praised.

c'. A book appeared that all the critics praised.

Moreover, they share the same gross internal syntax, both consisting of something (the relative expression in the one case, *that* in the other case) that is a sister of a S that contains a gap, a claim for which arguments will be given later in this section.

Since the *that* of *that*-relatives is neither a relative pronoun nor (obviously) a demonstrative, the most obvious thing to identify it with, if it is not to be something *sui generis*, is the complementizer *that*, which is what Jespersen (1885 and subsequent works) took it to be. Let us in fact follow Jespersen's proposal, which has at least the virtues of providing the correct constituent structure (*that* is likewise a left sister of a complement S) and of correctly implying that *that* cannot occur within complex relative expressions the way that relative pronouns can. Since the relative expression of the Wh-relative appears to occupy the same surface position as the *that* of the *that*-relative, a fairly obvious proposal to make, and one that has met with widespread acceptance, is that both Wh-relatives and *that*-relatives have a deep structure containing the complementizer *that* and that the relative expression is moved into the 'Comp position' occupied by *that* in the derivation of Wh-relatives. The principal details that need to be filled in in order to convert this suggestion into a real analysis of restrictive relative clauses are: (i) What underlies the relative pronoun? (ii) What is responsible for the gap in the *that*-relative— is an element such as would underlie a relative pronoun simply deleted, or does

such an element undergo conversion into a relative pronoun and movement into the Comp position before being deleted? and (iii) What is the relationship of bare relatives to Wh- and *that*-relatives— do they have the same deep structure and undergo deletion of the *that*, or do they not have any *that* in their deep structures (in which case an analog to question (ii) must be answered: what is then responsible for the gap in bare relatives?)?

There are a number of conceivable answers to question (i): perhaps relative pronouns appear as such in deep structures, perhaps corresponding personal pronouns underlie them, or perhaps corresponding 'full' constituents (such as *the person* or *that person* in the case of (1a)) underlie them. Actually, the first two of these answers differ from one another only insofar as a distinction between personal and relative pronouns needs to be drawn in deep structure: if the distinction is predictable, the difference between those two answers vanishes. Whether the third answer is materially different from the first two depends on what counts as a 'corresponding full constituent'. If 'corresponding full constituent' is taken as requiring that the item have the same determiner as the host constituent, the third answer can be dismissed as semantically absurd, e.g. (8) has nothing to do with the proposition that hardly anyone voted for Clinton, so the S that underlies the relative clause would correspond to *Hardly any persons voted for Clinton* if the relative pronoun corresponded to a deep structure constituent *hardly any persons*:

(8) Hardly any persons who voted for Clinton are happy with his foreign policy.

However, if 'corresponding full constituent' is taken to mean a constituent in which *the* or *that* is combined with the head N of the host (e.g. here *Those persons voted for Clinton*), the third answer differs but little from the second, since what underlies the relative pronoun would now just be a different anaphoric NP.

Whether the difference between relative and personal pronouns is predictable depends on what material there is in syntactic structures from which one might be able to predict the difference, and I will shortly adopt a proposal that will provide a basis for distinguishing relative pronouns from personal pronouns and thus allow one to take personal pronouns (or more accurately, in view of S1.1e, entities such as underlie personal pronouns) to underlie relative pronouns. There is in fact a type of sentence in which personal pronouns and corresponding

relative pronouns count as identical, namely those like (9).

(9) We should nominate a person who is a Republican and is proud of it.

Proud of it here means 'proud (of) that he is a Republican', and if this use of *it* requires a linguistic antecedent (which I wish to maintain), the only plausible candidate for that antecedent is the first conjunct in the structure *[a person [that [[he$_i$ is a Republican] and [he$_i$ is proud that [he$_i$ is a Republican]]]]]$_i$* that will underlie the NP according to the proposal that personal pronouns underlie relative pronouns. In addition, personal pronouns (stretching the term so as to include such words as *there* and *then*) are the counterparts to relative pronouns in paraphrases of relative clauses in terms of the *such that* construction ('the person such that [I talked to him]'; 'the place such that [I found the money there]').

A personal pronouns bears a referential index, either a constant index, if the pronoun has a determinate reference, or a variable index, if the antecedent is a quantified expression that binds the variable in question. The *who* of (9) presumably has as its referential index the variable that is bound by the existential quantifier manifested as *a*, just as the relative pronouns in the following examples presumably bear indices corresponding to the variable that the quantifier binds:

(10) a. Every person who knows Diane admires her.

b. No person who has studied Sanskrit thinks it is easy.

c. All concerts at which Mahler symphonies are played are well attended.

d. Most persons who love their mothers admire their fathers.

However, it is fairly implausible to suggest that the relative pronoun has as antecedent the whole quantified NP that it is contained in; indeed, the only syntactic constituent in (9) that could plausibly be spoken of as an antecedent of the relative pronoun is the N' to which the relative clause is adjoined. I will accordingly adopt the device of indexing the host N' with the same index that is borne by the pronoun that is to be manifested as the relative pronoun. Where the NP containing the relative clause has a determinate reference, the referential index of the whole NP can be attached as an index to an N' that hosts a restrictive relative. In both cases there will be an [N' S] combination in which the N' bears an index that appears on a pronoun within the S, and a

pronoun bearing that index will be what underlies the relative pronoun.[1] (There can be more than one such pronoun, as in (10d), where *he$_x$ loves his$_x$ mother* underlies the relative clause; in such cases, one occurrence of the pronoun is manifested as the relative pronoun, and the other occurrences of the pronoun have the relative pronoun as antecedent, subject to the usual restrictions on where pronouns can be in relation to their antecedents.) These decisions then force us to adopt a transformation of **Relative Pronoun Formation**, which applies with an [N' S] combination as its domain, converting a pronoun in the S that bears the index of the N' into a relative pronoun. The transformation (henceforth, **Relative Wh-movement**) that moves the relative expression into the Comp position of the relative clause will also have the [N' S] combination as its domain, since it too is contingent on identity between the index of the N' and the index of the pronoun. This means that relative pronouns are moved in a single step from their position within the relative clause to the complementizer position of the whole relative clause and are not (as claimed by e.g. Chomsky 1973) moved up the tree one S at a time.[2] For example, in a structure like (11), the conditions for converting a personal pronoun into a relative pronoun and for moving it into the Comp position of S_1 are not met in S_1, S_2, or S_3 because the N' whose index determines what item those transformations affect is not within those Ss:[3]

(11) [$_S$ I'm looking for the man [$_S$ that someone told me [$_S$ that Ann thinks [$_S$ that Marcia offered the job to him$_i$]]]]

Thus the relative pronoun cannot be moved into the Comp position of S_1 via those of S_2 and S_3 the way that Chomsky's claims demand.

I now turn to question (ii). There are two possible treatments of the gap in *that*-relatives: either the relative pronoun is deleted **in situ**, i.e .without being moved to the front of the relative clause, or the relative pronoun is moved to the Comp position of the relative clause and is deleted from that position. Since deletion of the relative pronoun is supposed to result in retention of the *that*, the latter alternative requires that one take Relative Wh-movement as creating a derived structure in which both the *that* and the relative expression occupy the Comp position, with subsequent derivational steps deleting one or other of them. For example, in the version of this analysis adopted by Chomsky and Lasnik (1977), (12a) goes through an intermediate stage *the*

the person [[who that] I talked to], either *who* or *that* can be deleted, and unless at least one of them is deleted, there is a violation of a constraint against a 'doubly filled Comp position' in surface structure.

The choice between these two alternatives is far from clear. An observation that at first glance may appear to require movement rather than deletion *in situ* is that *that*-relatives are subject to the same 'constraints on movement transformations' (to be discussed in §15b) that Wh-relatives are:

(12) a. *the person who/that [you talked to Oscar and a friend of Ø]

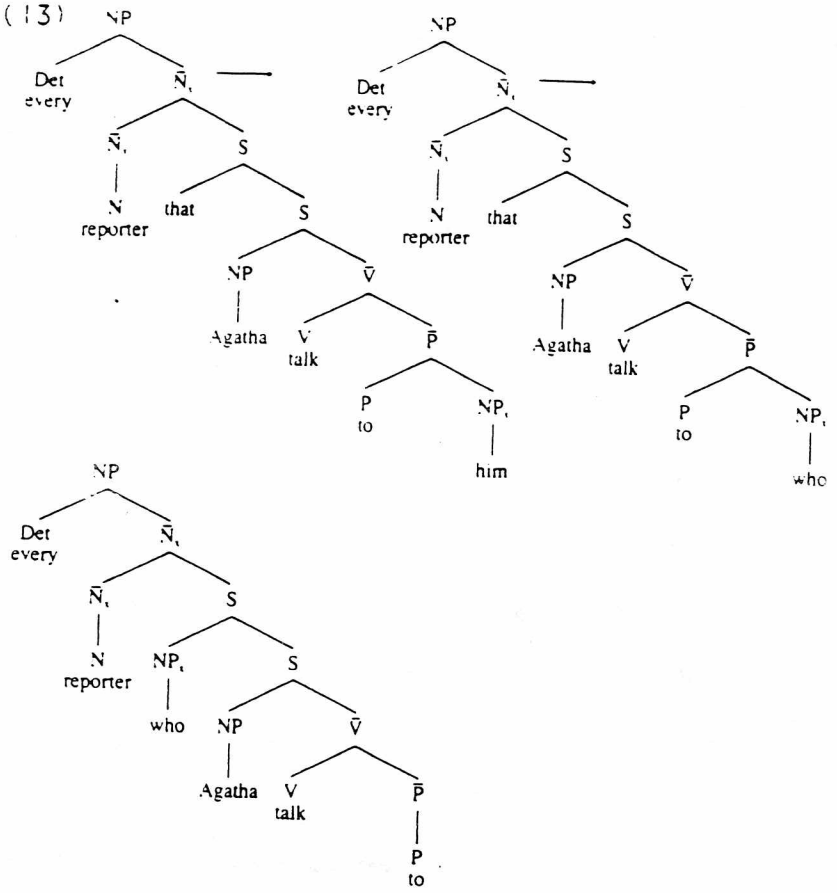
b. *the policeman who/that [the FBI is looking for the person who killed Ø]

c. *the reporter who/that [[that John talked to Ø] is likely]

d. *the person who/that [John says that [Ø talked to you]]

That is, the possibilities for both types of relative clauses appear to constrained by a restriction excluding extraction from a coordinate structure (12a), from a dependent S in a NP (12b), from a sentential subject (12c), or of the subject of a S with an overt complementizer (12d). Thus, if the oddity of the *that*-relatives in (12) reflects violation of constraints specifically excluding **extraction** from coordinate structures, etc., then the derivations must involve the same movement of the relative pronoun that gives rise to the unacceptability of the Wh-relatives, and thus the derivation must involve movement rather than deletion *in situ*. To give such an argument, however, we must justify the claim that the constraints that are violated in (11) are specific to **movement** transformations, i.e. that they do not also apply to deletion transformations. If deletions as well as movements are subject to these constraints, then both derivations account equally well for the unacceptability of (12: that). I will in fact eventually argue in §15c that these constraints constrain deletions as well as movements, which means that both versions of the derivation remain worthy of consideration. To simplify the exposition in the remainder of this chapter, I will arbitrarily frame the discussion in terms of deletion *in situ*, though as far as I know, acceptance of the movement analysis of *that*-relatives would not affect any of the points to be made. The derivations of *every reporter who/that Agatha talked to* will then be as in (13):

(13)


NP
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I now take up question (iii), the question of whether bare relatives are simply *that*-relatives whose *that* is deleted. Bare relatives do not have exactly the same external syntax that Wh- and *that*-relatives do. When relative clauses are stacked, the innermost relative clause can be bare, but the subsequent ones cannot:

(14) a. The book that I bought that Ann had recommended was boring.

a'. The book I bought that Ann had recommended was boring.

a'. *The book that I bought Ann had recommended was boring.

While Wh- and *that*-relatives can be extraposed fairly freely, extraposition of bare relatives generally results in low acceptability, though they are occasionally attested:

(15) a. John looked up the information (that) Mary had requested.

a'. John looked the information up that/*Ø Mary had requested. (Culicover 1976:20)

b. Where did the pencil go you sharpened yesterday? (Hi and Lois, March 1990)

One well-known restriction on internal syntax that applies only to bare relatives is that the gap may not be the main subject of the relative clause:[18]

(16) a. the person who/that/*Ø was talking to me

b. the assumption which/that/*Ø makes his conclusion plausible

Various authors (Culicover 1976, Harris and Vincent 1980, Weisler 1980) have noted an additional restriction on internal syntax, namely that a bare relative cannot begin with an ad-S, indeed (in view of the preceding restriction) ~~it cannot begin~~ with anything other than its subject:

(17) I discovered the criteria that/*Ø evidently I had not been meeting. (Harris and Vincent 1980:805)

These differences have been taken by Weisler as evidence that bare relative clauses do not have any complementizer. However, I see no connection between that conclusion and the above facts, since the behavior of bare relatives noted here is not parallel to that of other clause types that lack a complementizer. For example, finite complements without *that* normally can be extraposed and can have an ad-S before the subject:

(18) a. It's obvious to me (that) John's lying.

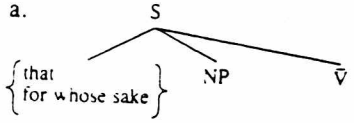
b. Agnes said (that) until recently the food here was great.

b'. I hope (that) some time soon you'll visit us.

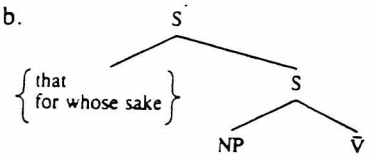
Since the examples in (14-15) and (17) in which bare relatives are of low acceptability (and also the examples in (16), though I note that in many varieties of English they are acceptable) begin with material that provides no signal that it is to be interpreted as part of a relative clause rather than of the higher clause, the source of their lowered acceptability may be in processing difficulties that they create, though I must emphasize that one is not entitled to conclude that that is why they sound so bad unless one has shown how an otherwise well motivated processing scheme would encounter difficulties (such as overloads of short-term memory) with the deviant examples that it would avoid in the normal-sounding examples. I will thus adopt a treatment of bare relatives in which they have the same deep structure as Wh- and *that*-relatives but undergo deletion of *that*, on the grounds that the case for an analysis in which they have no complementizer at all is too weak to justify the difference in deep structure that Weisler and others have proposed.

I turn now to the internal structure of restrictive relative clauses. Only two answers to the question of how the relative expression (e.g. *for whose sake*) or the *that* fits into the constituent structure of a relative clause have been seriously advanced: that the relative expression or the *that* is a sister of the NP and V' of the relative clause (19a) or that it is their aunt (19b):

(19) a.



b.



The relevant evidence relates to phenomena where the NP and V' could function as a unit that did not include the *that* or relative expression. For example, we can argue that both restrictive and nonrestrictive relative clauses have a structure as in (19b) rather than (19a) on the grounds that the NP V' sequence behaves as a unit with regard to conjoining:

(20) a. The book which/that [[Smith praised] and [Jones panned]] is on the best-seller list.

b. A person about whom [[conservatives publish denunciations] and [liberals express serious misgivings]] can't be all bad.

c. Stalin, by whose orders [[millions were killed] and [hundreds of millions were enslaved]], was feared by all.

Another relevant phenomenon is Right-node-raising. Here the NP and V' of a restrictive relative behave like a unit:

(21) a. Tell him no more than, nor even all that, he'd like to hear. (taken from Bresnan 1974)

b. The reasons for which and the considerations despite which Wilson called for a declaration of war are poorly understood.

We can thus say with confidence that the surface constituent structure of restrictive relatives is as in (19b).

The gap in a relative clause of any of the three types can be arbitrarily far down in the relative clause:

(22) a. the person who/that/Ø [you talked to Ø]

b. the person who/that/Ø [John says that [you talked to Ø]]

c. the person who/that/Ø [they tell me that [John says that [you talked to Ø]]]

(23) a. the city where [the meeting was held Ø]

b. the city where [it's likely that [the meeting was held Ø]]

c. the city where [I read somewhere that [it's likely that [the meeting was held Ø]]]

d. the city where [Violet tells me that [she read somewhere that [it's likely that [the meeting was held Ø]]]]

This is not to say that just any position in a relative clause can be the site of the gap corresponding to the relative expression. There are a number of restrictions that rule out gaps in such examples as the following:

(24) a. *the person who [you talked to Oscar and a friend of Ø]

b. *the policeman who [the FBI is looking for the person who killed Ø]

c. *the city where [that [the meeting will be held Ø] is likely]

d. the person who [John says (*that) [Ø talked to you]]

The principles that rule out the derivations of these sentences will be taken up in chapter 15. They include the Coordinate Structure Constraint, already taken up in chapter 9, which excludes steps in which a transformation applying to a domain containing a coordinate structure does not affect all conjuncts alike (as in the derivation of (24a), where a relative pronoun is extracted from only

one conjunct of *Oscar and a friend of whom*), as well as constraints excluding the extraction of material from 'complex NPs' (24b) or from sentential subjects (24c), or the extraction of the subject of a S whose complementizer is retained (24d).

The material that is moved into the Comp position of a relative clause may consist of more than just a relative pronoun:

(25) a. the cook from whom I learned this recipe

b. the author whose book Roger is reviewing

c. the poet from whose best-known work I selected that passage

d. an author most of whose works are completely forgotten

e. an opera the last three bars of the overture of which contains a fiendishly difficult horn part.

Such examples illustrate a general property of movement transformations, namely that movement of an item (in this case, movement of the relative pronoun into Comp position) is allowed to affect not merely the item itself but a NP orP' containing ~~that item~~. This phenomenon is referred to as **Pied-piping**, to use the term coined by Robin Lakoff (cited in Ross 1967a), in which the item whose movement is called for (here, the relative pronoun) is likened to the Pied-Piper of Hamlin and the material with which it is combined to the rats and/or children. Pied-piping is strictly speaking optional, with the caveat that what is left behind must be able to stand on its own, and thus the option of not doing Pied-piping is excluded in such cases as (26b), in which the relative pronoun is part of the determiner of a NP:

(26) a. the cook who I learned this recipe from.

b. *the author [who [~~Roger~~ is reviewing Ø's book]]

b'. *the author [whose [~~Roger~~ is reviewing Ø book]]

It was argued in §12a that restrictive relative clauses fit into a constituent structure in which it modifies an N'; this is one of the numerous respects in which nonrestrictive relatives will be shown in §13b to differ from restrictive relatives. The structure with the restrictive relative modifying an N' yields the correct prediction that restrictive relative clauses can be stacked, since there is nothing to prevent the N' of an $[_{N'}$ N' S] configuration from itself having the

interrogative pronouns, even if they are given a **deep structure** analysis parallel to that of the indefinite pronouns, do not contain a determinate surface N' to serve as a surface host for a restrictive relative. In §22c I will sketch an approach to the variable acceptability of examples such as (30d) in terms of a **patch**, that is, a strategy for extending a grammar so as to provide for ways of expressing deep structures that would otherwise not correspond to any surface structure in a way that conforms to the grammar (as here, where (30d) will have a well-formed deep structure irrespective of the acceptability of its surface form).

There are in fact a few modifiers that can appear in surface combinations with interrogative words that parallel combinations with indefinite pronouns (35a-c), and one of these modifiers can indeed combine with an interrogative word whose indefinite counterpart does not allow it (35d):[7]

(35) a. Everything else is forbidden.

What else is forbidden?

*Several activities else are forbidden.

b. He found something/*someone of yours.

What/*Who did he find of yours?

c. Where in London can you get authentic Burmese food?

Somewhere in London you can get authentic Burmese food.

d. How else could you fix it?

*I'll fix it somehow else.

I will leave unresolved the question of how to prevent the account of the difference between *who* and *someone* suggested here from incorrectly ruling out the acceptable sentences in (35).

I turn now to **infinitival relatives**, which I will regard as nonfinite counterparts of the finite restrictive relatives that have been considered so far. For most speakers, infinitival relatives allow an overt relative expression only in the form of a prepositional phrase:

(36) a. a shovel with which to dig the hole

a'. a hole (*which) to fill with earth

b. a person to whom to show respect

b'. a person (*who) to respect

c. a day on which to relax

c'. a day (*when) to relax

d. premises from which to draw interesting conclusions

d'. premises (*which) to draw interesting conclusions from

e. %an author whose books to buy

I have used parentheses in (36) to suggest that infinitival relatives with no overt relative expression take the place of structures involving a full relative clause with *who, which*, etc. as the relative expression. This conjecture is supported by the fact that infinitival relatives without an overt relative expression exhibit the same sorts of 'incomplete constituents' as do full relative clauses and have interpretations parallel to expressions in which a relative pronoun corresponds to the 'gap':

(37) a. a shovel to dig the hole with Ø

a'. a shovel which you can dig the hole with Ø

b. the person to give the money to Ø

b'. the person who you should give the money to Ø

c. a topic to write an article about Ø

c'. a topic which I can write an article about Ø

Infinitival relatives without an overt relative expression, but not those with one, allow *for* plus a subject NP:

(38) a. a shovel for us to dig the hole with

a'. *a shovel with which for us to dig the hole

b. the person for you to give the money to

b'. *the person to whom for you to give the money

c. a topic for the students to write papers on

c'. *a topic on which for the students to write papers

However, an underlying subject must be posited even for subjectless infinitival relatives, since they can take forms whose derivations require the positing of a S to serve as the domain of application for such transformations as Passive and Raising:

(39) a. a priest (for us) to be blessed by

a'. a priest by whom to be blessed

b. a problem (for us) to start working on

b'. a problem on which to start working

The combination of N' and infinitival relative (of any of the above forms) behaves as a constituent:

(40) a. John bought several [[books for his wife to read] and [records for the children to listen to]].

b. John bought several [[knives with which to slice vegetables] and [containers in which to store leftovers]].

Indeed, infinitival relatives share many of the properties of restrictive relatives, e.g. they can be extaposed (41a-a'), they can be stacked, both with other infinitival relatives and with finite restrictive relatives (41b-b", c-c"), and they do not allow relative expressions containing *which N* (41d):

(41) a. A knife has been developed with which to peel grapes.

a'. A knife has been developed for people to peel grapes with.

b. I've just found a pad to write on on which to compose my sonnet.

b'. I've found a pad to write on that I can use for taking my notes.

b". I've found a pad that has extra-narrow rulings for Alice to take her notes on.

c. There are several topics on which to do research for us to work on.

c'. Here's a topic on which to do research that the Bargle Foundation is likely to support.

c". Here's a topic that the Bargle Foundation is likely to support on which to do research.

d. *John was looking for a hammer with which tool to break open the coconut.

One characteristic of restrictive relatives that infinitival relatives obviously do not share is the possibility of having *that* in place of a relative expression. But that is not surprising, since infinitival relatives have the form not of (finite) *that*-clauses but that of *for-to* complements. If finite restrictive relatives have an underlying *that* complementizer, the most plausible way to distinguish between finite and infinitivel restrictives in deep structure is to hypothesize that they

have different complementizers: *that* in the finite relative and *for-to* in the infinitival relative. We can then generalize the treatment of finite relatives given above by saying that relative expressions either replace the complementizer or are deleted, irrespective of what the complementizer of the relative clause is.

Movement of a relative expression such as *to whom* to the front of the relative clause puts it in place of the complementizer (regardless of whether *that* or *for-to* is the underlying complementizer) and thus leaves no complementizer in the surface form. The proposal accounts for the unacceptability of examples like (38c'), in which *for* cooccurs with a relative expression, but does not in itself account for why there are no corresponding expressions (such as **a shovel with which us to dig the hole*) that simply lack the *for*. I will adopt this proposal, noting that it must be supplemented by some account of why simple relative expressions are excluded (**a book which to read*) and why presence of an overt relative expression in an infinitival relative requires absence of an overt subject.

I return now to finite restrictive relatives and some problems not covered above. The derivations sketched above satisfactorily cover quantified and referential NPs. Let us see whether they are also applicable to NPs in predicate position. One way of extending the analysis to relative clauses on predicate NPs would be to follow the lead of Quine (1960:118), who treats the indefinite article of a predicate NP as a quantifier, e.g. he treats (42a) as having a logical form like (42b):

(42) a. John is a lawyer.

b. (For some lawyer x)(John = x)

I find that proposal counterintuitive because it appears to reverse the roles of the semantic constituents of the sentence: it treats (42a) as if it said how John fits into the class of lawyers rather than how lawyerhood applies to John. Furthermore, while quantified NPs can enter into scope relations with other elements of a sentence, predicate NPs cannot, e.g. while (43a) allows an interpretation (43a') in which the negation is in the scope of *a friend of mine*, (43b) does not, that is, it does not allow an interpretation 'There is a friend of mine that John is not' (= 'I have a friend other than John'):

(43) a. John didn't talk to a friend of mine (, namely Bert).

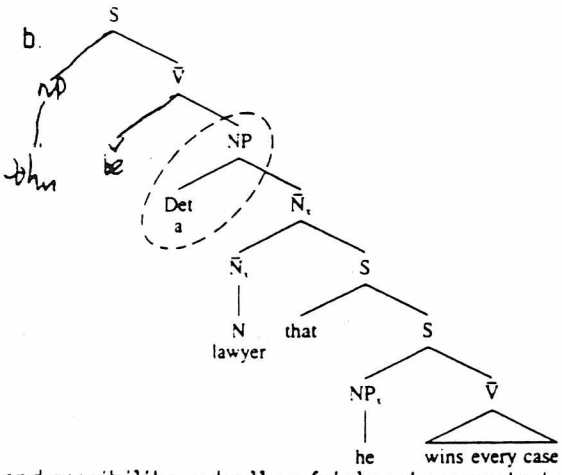
a'. (a friend of mine)$_y$ not (John talked to y) (= 'There is a friend of mine that John didn't talk to')

b. John isn't a friend of mine (*, namely Bert).

I thus wish to treat the articles of predicate NPs as not corresponding to quantifiers; indeed, I would claim that they are semantically empty. There are a number of ways in which this might be done within the framework being developed here. The first is to treat the predicate NPs of such sentences as (44a) as having a deep structure with a variable index (44b), as in the case of nonpredicate NPs, treat the N' as denoting a property (here, the property of being a lawyer who wins every case), and treat the predicate NP as a whole as not bearing any index:

(44) a. John is a lawyer who wins every case.

b.



A second possibility, actually a fairly minor variant of the first, is to omit the part of (44b) in the dotted circle, i.e. to treat the article as absent entirely from the deep structure (thus in deep structure there is a predicate N' but no predicate NP); in this variant, no stipulation need be made that the predicate NP bears no index (since in deep structure there is no predicate NP to bear an index), and a transformation inserting an article in otherwise article-less NPs must be posited.[17] I will in fact assume this second proposal in the remainder of this book.

Besides gaps in relative clauses, English allows to a limited extent the use of a **resumptive pronoun**, i.e. a pronoun occupying the position that a relative pronoun would occupy prior to its being moved into Comp position:

(45) a. the guy who they don't know whether he wants to come

b. the lawyer who he and his wife had dinner here last night

c. a student who I can't make any sense out of the papers that he writes

While such relative clauses are fairly marginal in English, they constitute a normal type of relative clause in a number of languages (e.g. Arabic; cf. Keenan and Comrie 1977, 1979).

Kroch (1981) notes that the vast bulk of the attestations of resumptive pronouns in English are in examples in which, as in (45), a 'normal' relative clause would violate one or other of the constraints alluded to above:

(45) a. *the guy who they don't know whether Ø wants to come

b. *the lawyer who Ø and his wife had dinner here last night

c. *a student who I can't make any sense out of the papers that Ø writes

Where normal relative clauses are available, Kroch notes, corresponding sentences with a resumptive pronoun generally sound very odd:

(46) a. She's the only woman here that I know Ø/*her well.

b. The student that Ø/*he got the highest score solved the hardest problems.

Kroch argues that English sentences with resumptive pronouns are strictly speaking not 'grammatical' but reflect a trick that we employ in order to complete sentences that we may begin but which our grammars do not in themselves provide us with any way of completing.

Resumptive pronouns appear always to correspond to a relative **pronoun**, not to a larger relative expression containing the relative pronoun:

(47) a. the actress who Tom wondered whether her father is rich

a'. *the actress whose father Tom wondered whether he is rich

b. the senator who the Times has just publishd the report that protests against him have been lodged

b'. *the senator protests against whom the Times has published the report that they have been lodged

This observation provides an additional, though weak, argument in support of my claim that a relative pronoun corresponds to an underlying personal pronoun. Suppose one makes the (not at all obvious) assumption that the 'patches'[19] by which one extends the coverage of a grammar are

restricted to units that figure in the underlying and surface forms of normal instances of the construction in question. Then if personal pronouns underlie all relative pronouns, a patch that retains the personal pronoun underlying a relative pronoun would be possible, but a patch that introduces a new personal pronoun would not; the former sort of patch would suffice to derive (47a,b), whereas it would take a patch of the latter type (i.e. one that inserts *he* or *they* in place of *her father* or *protests against them* as a concomitant to the movement of those expressions into Comp position) to provide 'derivations' for (47a',b').[20]

One final question that is worth discussing in this overview of the syntax of restrictive relative clauses relates to cases in which the 'relativized' constituent is the subject:

(48) a. The person who/that bought this car is a millionaire.

b. John, who has been my neighbor for years, is about to move to Texas.

In such examples, the *that* or relative expression is followed not by a NP V' sequence but just by a V'. The V' is of course as much of a constituent as when it appears in any other sentence. What isn't clear, however, is whether the V' in such cases constitutes a S: do all relative clauses have a surface form [X S], or does the underlying S whose subject is relativized lose its S-hood, so that in the surface structure of the relative clauses in question there will be only one S-node rather than the two that are indicated in (19b)?

The most obvious type of example to look at in which it should make a difference whether the V' that follows the relative expression in (48) etc. is also a S are examples in which it is conjoined with a S in which a non-subject is relativized, e.g.:

(49) a. the book which appeared last year and Smith reviewed for the Post

b. *the book which Smith reviewed for the Post and won a Pulitzer Prize

If the V' in *the book which appeared last year* or *the book which won a Pulitzer Prize* is also a S, it should be conjoinable with Ss having the same semantic function. The acceptability of such examples depends heavily on the order of the conjuncts, i.e. the conjoining is at most mildly odd when the 'subject relative' is the first conjunct, as in (49a), but is quite unacceptable when it is the second conjunct, as in (49b). The fact that the order of conjuncts makes such a difference leads me to conjecture that the unacceptability of (49b) is due not to the conjoining of items of different

categories (a characteristic in which it is no different from (49a)) but from the perceptual difficulty caused by the fact that *won a Pulitzer Prize* in (49b) looks as if it is conjoined with the preceding V' while its meaning requires that it be conjoined with the S. Confirmation of the hypothesis that a subject relative pronoun is followed by a S and not just a V' is provided by examples such as (50a), in which the relative pronoun is followed by a constituent that can be a left modifier of a S but not of a V':

(50) a. a person who for years has been harrassing me

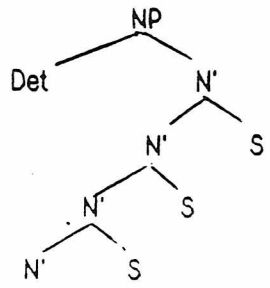
b. ??He for years has been harrassing me.

b'. For years he has been harrassing me.

I will thus tentatively take examples like (48) to have a (19b) surface structure, with the V' making up a surface S.

form N' S:

(27)

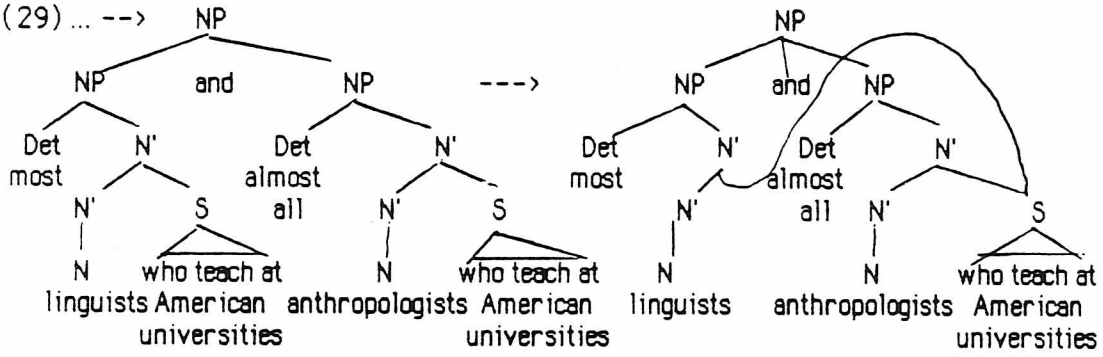


Examples like (28) seem at first to argue that a restrictive relative clause is not a modifier of an N' but is rather attached to a consituent made up of Det and N':

(28) Most linguists and nearly all anthropologists who teach at American universities think the Bureau of Indian Affairs is imperialistic.

However, (28) can alternatively be viewed as the result of applying Right-node-raising to a conjoined NP in which both N's have identical restrictive relatives, in which case (28) would have a derivation as in (21):[6]

(29)



Since the underlying structure posited in (29) fits the meaning of (28) and since the derivation in (29) is available at no cost, a satisfactory account of (28) is available without the positing of any configuration besides [$_{N'}$ N' S] for restrictive relative clauses.

A more serious problem for an analysis of restrictive clauses as adjuncts to N's is that they can occur in combination with words such as *someone, anything, nobody,* and *who* that appear to be not N's but whole NPs:

(30) a. I've just run into someone that I hadn't seen for years.

b. Anything that you can do will be appreciated.

c. Nobody who has ever met John can believe that he's guilty.

d. Who that you know would make a good candidate?

(31) a. *I've just run into an interesting someone.

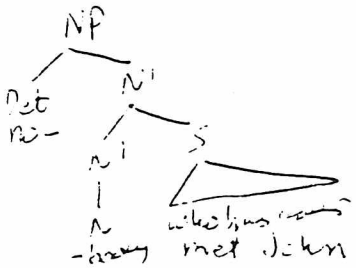
b. *I couldn't find a satisfactory anything.

c. *The most respected nobody in Scarsdale has just had a heart attack.[5]

d. *An incompetent who did you ask for help?

If each word of a sentence must be a constituent in surface structure, then the relative clauses in (30) cannot be adjuncts to an N', since the smallest constituents to which they could be adjuncts would then be NPs (*someone*, etc.). However, if we allow mismatches between syntactic boundaries and word boundaries, we can treat *someone, anything, nobody, everywhere*, etc. as consisting of a Det (*some-, any-, no-, every-*) and an N' (*-one, -thing, -body, -where, -time*, ...) and treat the restrictive clause as an adjunct to that N':

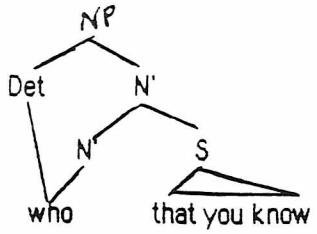
(32)



The determiner part of these words is in fact synonymous with the corresponding independent determiner,[6] and the noun part, while generally different in meaning from the homophonous independent word (e.g. the *-body* of *somebody* means 'person', not 'body'), can still be paraphrased by a noun.

In the case of *who* and other interrogative pronouns (30d), the cost of maintaining the N-adjunct analysis of restrictive relatives would be to allow a mismatch not only between syntactic boundaries and word boundaries but indeed between syntactic boundaries and morphemic boundaries: *who, what*, etc. would have to be decomposed into parts that do not correspond to separate morphemes in surface structure (33a); such a treatment of interrogative pronouns should not be dismissed out of hand, since something similar will be needed anyway for certain *any-* and *no-* words that likewise fail to split into morphemes in the neat way that *anything* and *nobody* do (33b):

(33) a. NP



b. ever = *any- + -times

never = *no- + -times

nothing [nəθiŋ] = *no- [no] + -thing

(dialectal) naught = *no- + -thing

Before deciding to accept or reject such an analysis, however, let us first check how far the parallelism between interrogative words and the various *every-*, *any-*, *some-*, and *no-* words goes. I have in fact exaggerated in reporting (30d) as acceptable: there is considerable individual variation in speakers' judgements of the acceptability of examples in which a restrictive relative follows an interrogative word, as contrasted with nearly unanimous total acceptance of examples as in (30a-c) in which an "indefinite" pronoun is followed by a restrictive relative. "Indefinite" pronouns allow the full range of reduced relative clauses, whereas combinations of an interrogative pronoun with a reduced relative are generally substantially reduced in acceptability:

(34) a. You should cast <u>someone tall</u> as Hamlet.

a'. ??<u>Who tall</u> can we get to play Hamlet?

b. Try <u>something odd</u> as a value of x.

b'. ??<u>What odd</u> have you tried as a value of x?

c. <u>Someone carrying a black briefcase</u> has the bomb.

c'. ??<u>Who carrying a black briefcase</u> do you think has the bomb?

I suggest that the difference between the morphological transparency of *someone*, etc. and the morphological opacity of *who*, etc. is responsible for the ability of the former but not the latter to host reduced relative clauses and for the fact that full relative clauses are uniformly accepted with *someone*, etc. but are accepted with *who*, etc. only by certain speakers and with great individual variation. Specifically, if, as has been argued here, restrictive relative clauses are hosted by N's, then the indefinite pronouns contribute an element (*-one*, *-body*, *-where*, etc.) to surface structure that can serve as the host of a (full or reduced) restrictive relative, whereas

b. Nonrestrictive relatives

There are a fairly large number of respects in which nonrestrictive relative clauses in English differ from restrictive relatives:

(i) ~~As just remarked,~~ restrictive clauses allow the option of having *that* or Ø in place of a relative expression, but nonrestrictive clauses do not. It should be pointed out these options are available not in all restrictive relative clauses but only in those having certain structural characteristics. For example, *that* or Ø can replace only a simple relative pronoun, not a more complex relative expression:

(1) a. The knife which/that/Ø he stabbed John with had a pearl handle.
b. The knife with which he stabbed John had a pearl handle.
b′. *The knife that/Ø he stabbed John had a pearl handle.

The conditions under which these alternative forms can be used will be taken up in §13c.

(ii) A nonrestrictive clause, but not a restrictive clause, takes "comma intonation": the nonrestrictive clause is separated from the preceding and following material by pauses, or at least delays, and the nonrestrictive clause ends on a falling pitch, after which the pitch level of the host sentence is resumed.

(iii) Restrictive and nonrestrictive clauses are subject to different restrictions on what they can be attached to. Only restrictive clauses can be attached to "indefinite pronouns" such as *everyone* and *nothing*, whereas only nonrestrictive clauses can be attached to proper nouns,[1] to Ss, or to $\bar{A}$s, ~~or~~ $\bar{V}$s, or $\bar{P}$s:

(2) a. Fred Schwartz, who was playing the harp when you came in, has just been hired at Stanford.
a′. *Fred Schwartz who was playing the harp when you came in has just been hired at Stanford.
b. Agnes has just moved to Donora, where Stan Musial grew up.
b′. *Agnes has just moved to Donora where Stan Musial grew up.

(3) a. John told me that Mary's operation was successful, which I was relieved to hear.
b. It says here that George Washington was gay, which I think is a lie.

(4) a. Everyone who attended the party had a good time.
a'. *Everyone, who attended the party, had a good time.
b. Someone who admires Jespersen should write a book about him.
b'. *Someone, who admires Jespersen, should write a book about him.

(5) a. Fred is very confident of himself, which I am not.
a'. *Fred is very confident of himself which I am not.
b. Vivian is more interested in zoology than I am, which you probably are too.
b'. *Vivian is more interested in zoology than I am which you probably are too.

(iv) The relative pronoun of a nonrestrictive clause on a predicate NP is interpreted differently from that of a restrictive clause in a predicate NP:

(6) a. John is a lawyer who/*which wins every case.
b. John is a lawyer, which/*who his father is too.

The relative pronoun of the restrictive clause refers to the subject of the predicate NP (i.e., the relative clause in (6a) expresses the proposition that John wins every case), while the relative pronoun of the nonrestrictive clause refers to the property expressed by the predicate noun (i.e., the nonrestrictive clause of (6b) says that John's father is a lawyer, not that he is John).

(v) Restrictive but not nonrestrictive clauses can be extraposed:

(7) a. A man who was dressed in black walked in.
a'. A man walked in who was dressed in black.
b. Marcia, who you wanted to meet, has just arrived.
b'. *Marcia has just arrived, who you wanted to meet.

(vi) Restrictive clauses can be "stacked" but nonrestrictive clauses cannot be:[2]

(8) a. The student who took the qualifying exam who failed it wants to retake it.
b. *Sam Bronowski, who took the qualifying exam, who failed it, wants to retake it.

(vii) When restrictive and nonrestrictive clauses are attached to the same NP, the restrictive clause(s) must precede the nonrestrictive clause:

(9) a. The contestant who won first prize, who is the judge's brother-in-law, sang dreadfully.

b. *The contestant, who is the judge's brother-in-law, who won first prize sang dreadfully.

(viii) Nonrestrictive clauses, but not restrictive clauses, allow the relative expression to have its own head noun:

(12) a. John belongs to the International Terrorist Fraternity, which organization has been accused of plotting mass murder.

b. *John belongs to a society which organization has been accused of plotting mass murder.

(ix) Only restrictive relatives have an infinitival form:

(11) a. I'll introduce you to the person to whom to send your receipts

b. *This is Fred Horner, to whom to send your receipts.

(x) Only nonrestrictive clauses can host interrogative tags:

(12) a. Marcia, who you wanted to meet, didn't you?, has just arrived.

b. *The violin on which Heifetz recorded the Elgar concerto, didn't he?, has been donated to the Smithsonian Institution.

(ix) Another difference, to which I now turn, provides direct evidence that NPs with restrictive clauses and NPs with nonrestrictive clauses differ in surface constituent structure, specifically that an $\bar{N}$ plus a restrictive relative behaves like a unit (indeed, like an $\bar{N}$) with regard to deletion of a repeated $\bar{N}$ or replacement of it by *one*, whereas an $\bar{N}$ plus a nonrestrictive clause does not:

(13) a. Tom has a violin that once belonged to Heifetz, and Jane has one too.

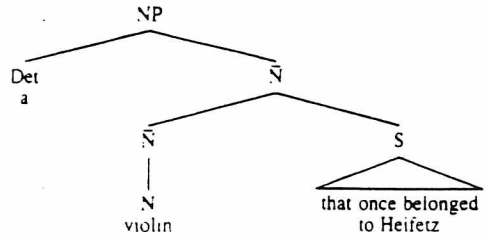
a'. Tom has a violin, which once belonged to Heifetz, and Jane has one too.

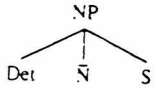
b. Tom has the violin that once belonged to Heifetz that was auctioned at Sotheby Parke Bernet, and Jane has the one that the Philharmonic used as a raffle prize.

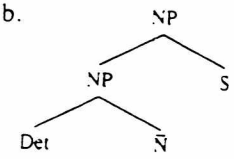
In (13a), the deleted material (*one* here does not replace that material but is the 'strong' form that *a* takes when its N' is deleted) is *violin that once belonged to Heifetz*; by contrast, in (13a') only *violin* can be the deleted item, i.e. (13a') can only mean '... and Jane has a violin too', not '... and Jane has a violin, which once belonged to Heifetz, too'. Similarly, in (13b) *one* replaces *violin that once belonged to Heifetz*. This fact

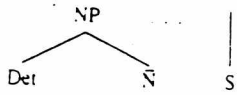
provides evidence that restrictive relative constructions have a surface structure as in (14), with an $\bar{N}$ and a restrictive relative clause making up a larger $\bar{N}$, while NPs with a nonrestrictive clause have some other constituent structure in which the $\bar{N}$ and the nonrestrictive clause do not make up an $\bar{N}$, as in the possibilities listed in (15):

(14)



(15) a. 

b. 

c. 

I will adopt (14) provisionally as the surface constituent structure for restrictive relative clauses. Later in this section we will attempt to find facts that will provide a basis for a choice among the alternatives in (15) for the surface constituent structure of NPs with a nonrestrictive clause. For the moment, I emphasize that (15c), in which the NP and the nonrestrictive clause do not even make up a constituent, must be considered seriously, i.e., we have as yet no justification for believing that a nonrestrictive clause is a constituent of a NP. There is some sort of syntactic relationship between a nonrestrictive clause and its **target** (as I will henceforth refer to the item that a nonrestrictive clause "modifies"), but we must not jump to the conclusion that that relationship is manifested in constituent structure—it could instead be, say, something like the relation of a pronoun to its antecedent.

It is misleading to give NPs the central role that they are accorded in the last paragraph. Recall that while restrictive clauses are always associated with a NP, the target of a nonrestrictive clause can be a constituent that is neither a NP nor contained in a NP:

(16) a. ($\bar{A}$) John is <u>afraid of snakes</u>, which I'm sure Mary is too.
b. ($\bar{P}$) Senator Snerd is <u>in Bermuda</u>, where most of his colleagues are too.
c. (S) It has been reported <u>that Senator Snerd is in Kuwait</u>, which can't be right.

Thus, if nonrestrictive clauses are to fit into surface constituent structure in a uniform way, their role in relation to NPs in examples like *your father, who I admire* should not involve any structural details of NPs that are not shared by the other constituents that can support nonrestrictive clauses. This observation provides additional reason for not assigning to nonrestrictive clauses a structure like (14) and casts some doubt on (15a). By contrast, the structure in (15b–c) can be taken as instances of more general structural configurations that are not restricted to NPs, i.e., (15b) would conform to a treatment of nonrestrictive clauses as modifiers, that is, as always fitting into an $[_X\ X\ S]$ configuration, with NP being only one of several categories that could fill the role of "X," and (15c) would conform to a treatment in which a nonrestrictive clause was positioned after but not adjoined to a constituent of any category that supports nonrestrictive clauses.

structure that can serve as the host of a (full or reduced) restrictive relative, whereas interrogative pronouns, even if they are given a **deep structure** analysis parallel to that of the indefinite pronouns, do not contain a determinate surface N' to serve as a surface host for a restrictive relative. In §22c I will sketch an approach to the variable acceptability of examples such as (22d) in terms of a **patch**, that is, a strategy for extending a grammar so as to provide for ways of expressing deep structures that would otherwise not correspond to any surface structure in a way that conforms to the grammar (as here, where (22d) will have a well-formed deep structure irrespective of the acceptability of its surface form).

There are in fact a few modifiers that can appear in surface combinations with interrogative words that parallel combinations with indefinite pronouns (27a-c), and one of these modifiers can indeed combine with an interrogative word whose indefinite counterpart does not allow it (27d):[7]

(26) a. Everything else is forbidden.
What else is forbidden?
*Several activities else are forbidden.

b. He found something/*someone of yours.
What/*Who did he find of yours?

c. Where in London can you get authentic Burmese food?

Somewhere in London you can get authentic Burmese food.

d. How else could you fix it?
*I'll fix it somehow else.

I will leave open here the question of whether the generalization that restrictive relatives modify only $\bar{N}$s is worth the price of accepting structures like (25a).

Let us return to the question of the external constituent structure of nonrestrictive clauses. The fact that combinations of target and nonrestrictive clause can appear in predicate position in cleft and pseudo-cleft sentences seems at first to suggest a constituent structure like (15b) in which the nonrestrictive clause and its target make up a constituent:

(27) a. It was Fred, who you met at my party, that I was just talking to on the phone.

b. What Mary likes the most is dancing, which unfortunately doesn't appeal to Roger at all.

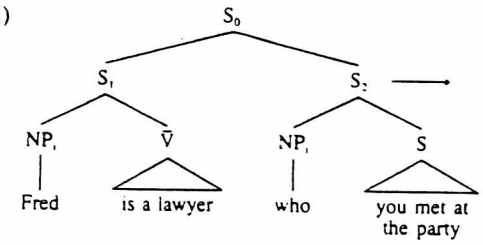
However, the existence of sentences like (27) is in fact consistent with the (15c) structure, since under (15c) the sequence "target + nonrestrictive

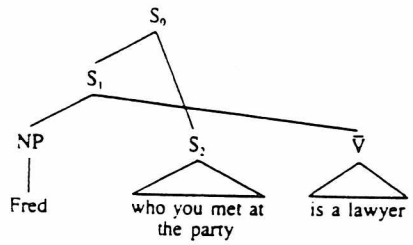
acceptability/

clause" need not be the predicate constituent of sentences like (17): the target could itself be the predicate constituent and be followed by a nonrestrictive clause just the way that (according to (15c)) nonrestrictive clauses follow but are not adjuncts to their targets.

For clarity's sake, let us consider one specific version of the (15c) hypothesis and see how it allows for sentences like (17). Specifically, let us suppose that nonrestrictive clauses are adjuncts to the whole sentence and that they are moved, without change of constituent structure, to a position immediately following the target:[8]

(18)





Suppose now that instead of S_1 in (18) we have whatever underlies the cleft sentence *It was Fred that I was just talking to*. According to the cyclic principle, whatever rules are involved in the derivation of the cleft sentence will apply on the S_1 cycle, yielding a derived structure with *Fred* in predicate position, and on the S_0 cycle the rule that positions nonrestrictive clauses applies, moving the nonrestrictive clause to the position immediately following *Fred* exactly the way that it does in derivations such as (18).

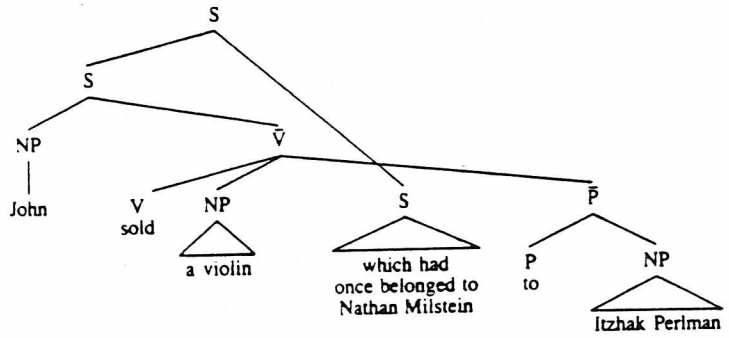
A possible piece of positive evidence for a (15c) constituent structure, and indeed, for a version of it as in (28), with the nonrestrictive clause not even part of the same clause as the host, is the interpretation of zero $\bar{V}$s when the antecedent contains a nonrestrictive clause:

(19) a. John sold Mary, who had offered him $600 an ounce, a pound of gold, and Arthur did ∅ too.

b. John sold a violin, which had once belonged to Nathan Milstein, to Itzhak Perlman, and Mary did ∅ too.

The understood $\bar{V}$s do not include the nonrestrictive clause, i.e., in (29a) the understood $\bar{V}$ is *sell Mary a pound of gold*, not *sell Mary, who had offered him $600 an ounce, a pound of gold*, and in (29b) it is *sell a violin to Itzhak Perlman*, not *sell a violin, which had once belonged to Nathan Milstein, to Itzhak Perlman*. The latter judgment is the clearer of the two: (29b) does not imply that the violin that Mary sold had belonged to Milstein. This provides evidence that (29b) has a constituent structure as in (30), with the nonrestrictive clause not a constituent of the $\bar{V}$ that it occurs in the middle of:

(30)



I will thus tentatively adopt a (15c) constituent structure for nonrestrictive clauses.

NONRESTRICTIVE CLAUSES The observation has often been made that a nonrestrictive clause accomplishes a separate **speech act** from the sentence in which it appears. For example, in (31a) the nonrestrictive clause is not part of the request for information but rather a reminder that one offers in the middle of making that request, and in (31b) the nonrestrictive clause is not part of the order but a separate act of informing that one carries out in the course of giving the order:

(31) a. Has John, who was talking to Mary a minute ago, gone home?
b. Put the turkey, which is in the refrigerator, into the oven.

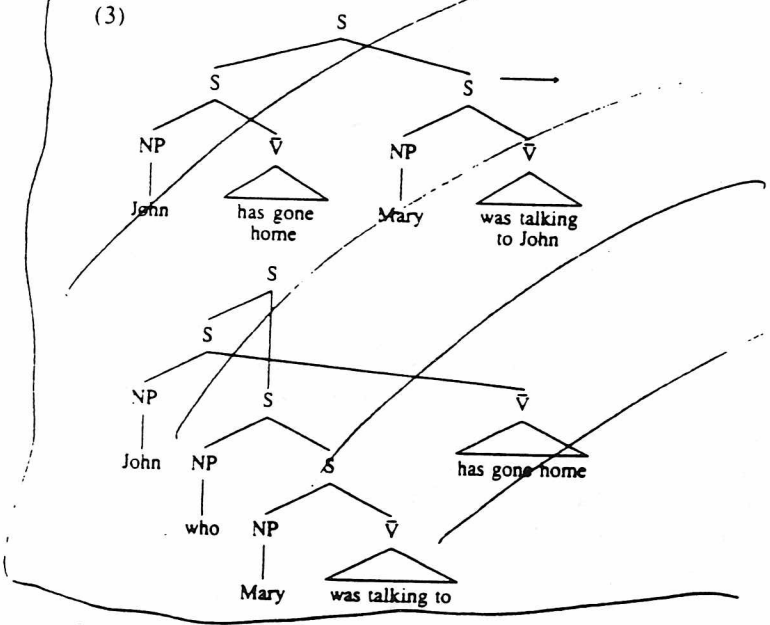
Indeed, to a large extent, sentences with nonrestrictive clauses are interchangeable with sequences of sentences, one of which accomplishes the sort of speech act (reminding, giving incidental information) that can be accomplished with nonrestrictive clauses:

(32) a. Has John gone home? He was talking to Mary a minute ago.
b. Put the turkey in the oven. It's in the refrigerator.

These observations, in conjunction with the conclusions [illegible] that nonrestrictive clauses do not combine into constituents with the items that

they "modify" and that the latter items can be of quite diverse syntactic categories, I suggest the following analysis of nonrestrictive clauses: (i) in deep structure the host S and the nonrestrictive clause are separate from one another; (ii) conversion of one of the two Ss into a nonrestrictive clause is contingent on that S corresponding to a speech act of a type that can be performed in nonrestrictive clauses and on its containing a constituent coreferential to some constituent of the other S; and (iii) the derivation involves replacement of the coreferential item in the nonrestrictive clause by the corresponding relative pronoun, movement of the relative pronoun to initial position in the nonrestrictive clause, and movement of the nonrestrictive clause to a position immediately following the coreferential item (its target) in the host S. This sketch is neutral with regard to whether the two Ss even make up a constituent. While I will treat them below as comprising a constituent, largely out of force of habit, the assumption that they make up a constituent plays no role in what follows. The following is then an illustration of the sort of derivation just sketched:

(3)



It will be convenient to introduce a term for the sort of movement that is posited in (3), in which a constituent is moved into a position adjacent to a "target" but is not combined with the target into a larger constituent. I suggest the term **adposition** for this, which will contrast with **adjunction**, in which the moved constituent is combined with another item into a larger constituent. The term "adposition" lends itself to the formation of deriva-

tives analogous to those of "adjunction," e.g., one can speak of a nonrestrictive clause as an **adposit** of its target, the way that one speaks of an extraposed complement as an adjunct of the $\bar{V}$.

The condition that there be coreferentiality between items in two separate Ss explains several differences between restrictive and nonrestrictive clauses with regard to what they can combine with. First, since NPs introduced by such quantifiers as *each*, *every*, and *no* cannot be coreferential with NPs in separate Ss, this condition explains why nonrestrictive clauses cannot appear in combination with such NPs:

(4) a. The doctor gave a lollipop to each child$_i$. *She examined him$_i$.
a'. *The doctor gave a lollipop to each child$_i$, who she examined.
b. Susan interviewed every senator$_i$. *He$_i$ is crooked.
b'. *Susan interviewed every senator$_i$, who is crooked.
c. No person$_i$ is perfect. *He$_i$ knows everything.
c'. *No person$_i$, who knows everything, is perfect.

By contrast, the quantifier plays no role in the acceptability of restrictive relatives, since the quantifier is outside the [$\bar{N}$ S] combination that makes up the restrictive relative clause construction, and the relevant coreferentiality is entirely within that combination:

(5) a. The doctor gave a lollipop to each child that she examined.
b. Susan interviewed every senator who voted for aid to the Contras.
c. No person who has a criminal record can get a job here.

Second, while Ss do not have the [Det $\bar{N}$] structure in which restrictive relatives occur, they can be coreferential to constituents of other Ss and for that reason can support nonrestrictive clauses:

(6) a. John says that Fred and Ethel are breaking up. I hadn't expected that.
a'. John says that Fred and Ethel are breaking up, which I hadn't expected.

Third, proper nouns make up a whole NP and thus do not allow for the [$_R$ $\bar{N}$ S] configuration of restrictive relatives, but they can be coreferential with NPs in separate Ss and thus can meet the conditions for supporting a nonrestrictive clause:

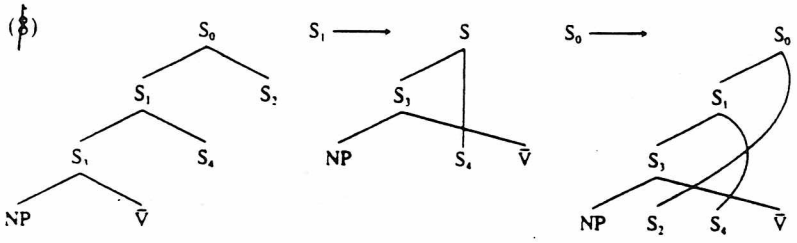
(7) a. John can't be trusted. You were talking to him a minute ago.
a'. John, who you were talking to a minute ago, can't be trusted.

Let us run down the list of other differences between restrictive and nonrestrictive clauses given ~~in §13a~~ and see which of them are accounted for above

by the analyses developed so far. The absence of *that* or zero as an introducer of nonrestrictive clauses will be accounted for if we can claim that the underlying Ss corresponding to nonrestrictive clauses do not allow a *that*-complementizer. Since nonrestrictive clauses are separate main clauses in deep structure, that is a reasonable enough claim, though we have not worked out the underlying distribution of complementizers in enough detail that we can say more than that yet. The "comma intonation" around nonrestrictive clauses must be accounted for in terms of a general theory of the relation of intonation to syntax. While significant advances have been made toward the development of such a theory (see, e.g., Ladd (1980, 1983) and Bing (1979)), I will not attempt to present such a theory here. I note, though, the plausibility of interpreting comma intonation as an iconic device for indicating the status of an expression as an "interruption," and observe that in the analysis developed here, nonrestrictive clauses but not restrictive clauses are moved into their host constituents and thus constitute interruptions.

If predicate NPs refer to properties rather than to entities, then a nonrestrictive clause can have a predicate NP as its target only if its relative pronoun refers to that property, as in [illegible]. The fact that nonrestrictive clauses cannot be stacked is a consequence of our assumption that nonrestrictive clauses are put immediately after the target constituent but are not adjoined to it: since a sequence of target and nonrestrictive clause does not make up a constituent, it cannot be coreferential to an item in another S and thus cannot serve as target to a second nonrestrictive clause. Another possibility for getting sequences of nonrestrictive clauses still has to be considered, though. Could placement of nonrestrictive clauses put a nonrestrictive clause **between** a constituent and a nonrestrictive clause of which it was the target?

(8)



A straightforward way of excluding such derivations, proposed by Emonds (1979), is to require that the nonrestrictive not merely be put directly after its target but that it directly follow its target in surface structure. As Emonds notes, if nonrestrictive clauses and their targets do not make up constitu-

ents, then this constraint rules out sentences in which a putative target is followed by two nonrestrictive clauses: only the first of the two nonrestrictive clauses would directly follow its target and thus the second would violate this condition. Emonds also notes that this condition excludes the extraposition of nonrestrictive clauses: an extraposed nonrestrictive clause would not immediately follow its target.

Where the target of a nonrestrictive clause is a NP, any restrictive clauses must precede the nonrestrictive clause: the restrictive clauses are constituents of the $\bar{N}$ of the NP, and are thus part of the target that the nonrestrictive clause must immediately follow. But what about the possibility of a nonrestrictive clause having an $\bar{N}$ as its target? Could a nonrestrictive clause precede a restrictive clause in virtue of being an adposit of the $\bar{N}$ of which the restrictive clause is an adjunct? In fact such examples are possible and the generalization given in §13a is false—a nonrestrictive clause can precede a restrictive clause in precisely this class of cases:

(9) Most ophicleides, which are a type of obsolete brass instrument, that are on display in museums are of German manufacture.

The fact that nonrestrictive clauses allow relative expressions of the form *which* $\bar{N}$ follows from the fact that a NP of the form [Det $\bar{N}$] can be coreferential to a potential target NP in a separate S:

(10) a. John belongs to the International Terrorist Fraternity. That organization has been accused of plotting mass murder.

b. John has admitted that he belongs to the International Terrorist Fraternity. That revelation surprises no one.

If formation of the nonrestrictive clause converts as much as possible of the coreferential constituent into a corresponding WH-word, this will yield such expressions as *which organization* and *which revelation* in such cases. By contrast, in the structure underlying restrictive relative clauses, the relative pronoun corresponds to a pronoun that makes up a whole NP, and thus no noun is available to remain in the relative expression.

The absence of an infinitival form of nonrestrictive clauses follows from the fact that an independent S does not have an infinitival form, and the possibility of using a nonrestrictive clause as host of an interrogative tag follows from the possibility of using an interrogative tag in a S that is anaphorically related to preceding S:

(11) a. *For it to rain tomorrow.

b. Marcia has arrived. You wanted to meet her, didn't you?

Finally, the fact that $\bar{N}$ + restrictive clause functions as a constituent with regard to conjoining and pronominalization, while $\bar{N}$ + nonrestrictive clause does not, reflects constituent structures that are built into the analyses adopted here: an $\bar{N}$ and an immediately following restrictive clause make up an $\bar{N}$, whereas an $\bar{N}$ and an immediately following nonrestrictive clause do not even make up a constituent.

c. Free relatives

There is a type of constituent that has the superficial appearance of an interrogative complement but is given an interpretation as a NP with a restrictive relative, as in (1), which can be given a paraphrase such as 'I'll buy the things that you tell me to buy':

(1) I'll buy what you tell me to buy. •NB will → Ø•

Such constituents (henceforth **free relatives**) are often difficult to distinguish from interrogative complements, and indeed many examples are ambiguous between an interrogative and a free relative interpretations:

(2) John saw what Mary was holding in her hand.

Suppose that Mary was holding an emerald in her hand. Interpreted as involving an interrogative complement, (2) says that John saw that Mary was holding an emerald in her hand; interpreted as involving a free relative, it says that he saw the emerald but is noncommital as to whether he saw that it was an emerald. We can get examples that are unambiguously the one or the other by combining the expression in question with either a verb that demands a complement or one demanding a nonsentential object:

(3) a. I'll ask what he's selling. (Interrogative complement)

b. I'll buy what he's selling. (Free relative)

There are in fact two types of free relatives: those in which the interrogative pronoun appears unadorned, as in the examples discussed so far (henceforth, **simple free relatives**), and those as in (4), in which the interrogative pronoun is combined with *-ever* (henceforth, ***-ever* free relatives**):

(4) I'll buy whatever he's selling.

The similarity in form and interpretation between (3b) and (4) could easily lead one to treat *-ever* as simply an optional accompaniment of the interrogative pronoun in free relatives. However, it will develop that simple and *-ever* free relatives differ syntactically in some important respects, and I will accordingly take pains to avoid the common error of lumping them together and assuming that characteristics of the one will be shared by the other.

Before going on, it will be worth justifying my use of the term 'interrogative pronoun'

(rather than 'relative pronoun') for the *Wh*-word that appears in free relatives. *What* and *how* are used in English only as interrogative and not as relative pronouns:

(5) a. What did you buy?

a'. the oysters which/*what I bought

b. How did Tom behave?

b'. *the way how Tom behaved

c. How nasty did their lawyer get?

c'. *my lawyer is nasty how theirs is

However, they both appear in both kinds of free relatives, though with *how* quite restricted in simple free relatives:

(6) a. I'll buy what(-ever) you want me to buy

b. I'll get there however/*how I got there last time.

b'. I like how it looks.

c. My lawyer will be however/*how nasty their lawyer is.

Moreover, *what* and *which* contrast in meaning in free relatives the same way that they do in interrogatives:

(7) a. What/??Which difficulties did they encounter?

a'. Whatever/??Whichever difficulties they encountered were easy to resolve.

b. Which/*What hand did he hold the chocolate in?

b'. Whichever/*Whatever hand he held the chocolate in must be filthy.

In restrictive relatives, *which* makes up a full NP in the relative clause and cannot serve as the determiner of a N, whereas both in questions and in *-ever* free relatives, *which* is a determiner and can appear without a following N only through ellipsis:

(8) a. The apples which (*fruit) I bought weren't ripe.

b. Which did you buy? (= which one/ones)

b'. I'll serve whichever I buy for dinner tonight. (= whichever one/ones)

In both questions and *-ever* free relatives, though not in relative clauses or simple free relatives, the interrogative or relative pronoun can be accompanied by *else* or by partitive expressions, or

by expressions such as *the hell*:

(9) a. What else do you want?

a'. I'll buy whatever else you want.

b. the persons who (*else) he invited

b'. *I'll buy what else he's selling.

c. Which of these computers do you like best?

c'. I'll buy whichever of these computers you like best.

d. *the laptop which of these computers I like best

e. What the hell did he want?

e'. Put it whatever the hell he tells you to put it

f. *Put it where the hell he tells you to put it.

f'. the place where (*the hell) he told us to put it

While free relatives look like interrogative complements, they differ from them in those respects in which interrogative complements behave like Ss, as is pointed out in Bresnan and Grimshaw (1978). Interrogative complements act like Ss by creating awkwardness when they are in the middle of a sentence, but free relatives do not:

(10) a. Is [what you bought] still in the car?

a'. Will [whichever stocks you invested in] be worth anything a year from now?

b. ?Is [how much he bought] of any importance?

Interrogative complements can be extraposed, while free relatives cannot (11), and interrogative complements but not free relatives allow a preposition (12a-a') or a 'possessed' noun (12b-b') to be brought along with the interrogative word through pied-piping:

(11) a. *It's still in the car what(ever) you bought.

b. It isn't important how much he bought.

(12) a. I'll buy what(ever) he was pointing at.

*I'll buy at what he was pointing.

a'. I'll ask what he was pointing at.

I'll ask at what he was pointing.

b. I'll buy *whose/?whoever's books he's selling.

b'. I'll ask whose books he's selling.

Interrogative complements take singular number agreement, irrespective of whether the *Wh*-expression is singular or plural, whereas the grammatical number of free relatives is that of the Wh-expression:

(13) a. What(ever) books he defaced were/*was priceless.

b. What books he defaced was/*were not disclosed. (Bresnan and Grimshaw's examples)

The observations about (10)-(11) provide evidence that the combination of Wh-expression and truncated S makes up a S in an interrogative complements but not in a free relatives. The observations in (12)-(13) provide evidence that the Wh-expression is the head of a free relative, but not of an interrogative complement. However, the latter observation is consistent with a number of possibilities as to what the internal structure of free relatives is: perhaps the truncated S that follows the Wh-expression is an adjunct of the whole Wh-expression, or perhaps it modifies an N' within the Wh-expression, as in an ordinary restrictive relative construction. These two possibilities for the constituent structure have different implications; for example, the latter structure but not the former provides for the possibility of stacking ordinary restrictive relatives on top of a free relative. Here the two types of free relative constructions diverge, since *-ever* free relatives support restrictive relatives, while simple free relatives do not:22'

(14) a. I'm going to do whatever John wants that I'm able to do.

a'. I'm going to do what John wants (??that I'm able to do).

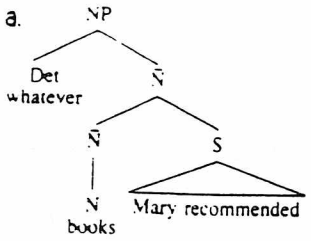
b. I bought whatever books Mary recommended that I could afford.

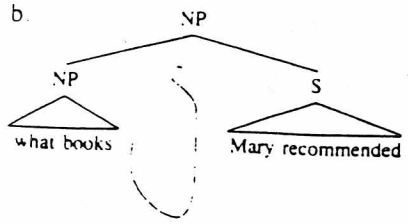
b'. I bought what books Mary recommended (??that I could afford).

c. I traveled to wherever I hadn't been before where I expected the food to be good.

c'. I traveled to where I hadn't been before (*where I expected the food to be good).

This observation provides reason to posit a structure for the *-ever* free relative in which the N and the truncated S make up an N' that the restrictive relative can then attach to, but one for the simple free relative in which the N and the truncated S do not make up an N', as in (15):

(15) a. 

b. 

reduce space

The following examples confirm that the N' + S sequence in *-ever* free relatives is an N', while the corresponding sequence in simple free relatives is not:

(16) a. Whatever books John wants that are in print will be easier to find than whatever ones that are out of print.

b. Whatever [[books John wants] and [records Mary has requested]] are sure to cost us a lot.

b'. ??What books John wanted and records Mary requested were easy to obtain.

Let us tentatively adopt these structures and take up the question of what sorts of deep structures and derivations the two kinds of free relatives have. In both cases there is a Wh-expression and a S with a gap that matches the Wh-expression. In either case we need to consider both the possibility of a 'movement analysis', in which the Wh expression is an underlying constituent of the S and is extracted from and adjoined to the S, and that of a 'deletion analysis', in which the deep structure of the free relative consists of the Wh-expression plus the S and the derivation involves a step deleting from the S a constituent matching the Wh-expression. Bresnan and Grimshaw (1978) argue against a movement analysis, on the grounds that free relatives do not allow pied-piping the way that restrictive relatives do:

(17) a. any books which you defaced the covers of

a'. any books of which you defaced the covers

a". any books the covers of which you defaced

b. You should avoid whatever man you were drawing caricatures of.

b'. *You should avoid of whatever man you were drawing caricatures.

b". *You should avoid [caricatures of whatever man][you were drawing].

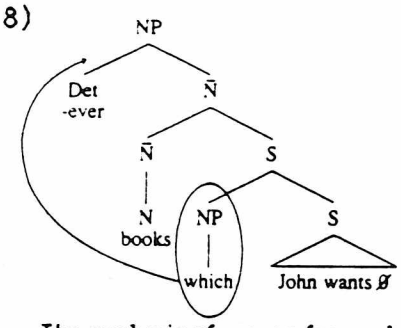
c. What books they defaced the covers of were easy to replace.

c'. *Of what books they defaced the covers were easy to replace.

c". *[The covers of what books] they defaced were easy to replace.

However, this is only an argument against derivations in which the Wh-word is moved into a position (such as the Comp position of an embedded S) that allows the extra material that is brought along with the Wh-word by pied-piping. For *-ever* free relatives, the Wh-word occupies a position where it combines with an N' to yield a NP, i.e. the sort of position that is otherwise occupied by a Determiner. Thus, an analysis of *-ever* free relatives in which the Wh-word is moved into a determiner position could also serve to exclude sentences such as (17b'-b"), say, an analysis in which the *ever* is taken to be a Determiner in deep structure (a plausible categorization in view of the possibility of identifying its contribution to semantic structure with that of the quantifier *any*), the sentential part of the free relative is identified with a restrictive relative clause, and the Wh-word is moved out of the relative clause and combined with the *-ever*:

(18)



The analysis of *-ever* free relatives sketched here yields the surface structure argued for above and accounts for the facts cited in (10)-(13) that were offered as evidence for such a structure. It also accounts for the fact that the sentential part of the *-ever* free relative does not allow a relative pronoun of its own and only marginally allows *that*, since the relative pronoun would replace *that* and then be extracted from the relative clause:

(19) You should order whatever books *which/??that John wants.

Against these advantages must be balanced the following points, which seem to demand ad hoc alterations in the analysis if it is to cover the full range of *-ever* free relatives. First, the analysis calls for an underlying structure having a N as head of the underlying relative clause structure; this means that if the analysis is to be made to cover free relatives without an overt head N (such as *whatever he said*), it will be necessary to posit a phonologically zero N with a semantic interpretation appropriate to the Wh-word (e.g. one meaning 'person' in the case of *whoever*). Second, as noted above, the range of Wh-words that appear in *-ever* free relatives

appears to match more closely those that appear in interrogative clauses than those used in relative clauses (i.e. it includes *what* and *how*)or Thus, to apply this analysis to the full range of *-ever* free relatives, it would be necessary to allow in the deep structures of restrictive relatives relative analogs to *what* and *how* and constrain them from appearing in surface structure unless they are extracted from the relative clause in a free relative construction.

The discussion so far has presupposed that free relative constructions are always NPs. Bresnan and Grimshaw (1978:335) offer examples as in (20) of free relatives that may belong to other categories:

(20) a. John will be however tall his father was. (A'? Measure expression?)

b. I'll word my letter however you word yours. (Adverb)

c. I'll put my books wherever you put yours. (Adverb or P')

d. John will leave whenever Mary leaves. (Adverb or P')

At least some of these free relatives can be analyzed as NPs by positing an understood P having the given expression as its object, e.g. by treating *wherever you put yours* in (20c) as the object of an understood preposition having the meaning of *at* Such an analysis (for which Bresnan and

Grimshaw argue) is reasonable for expressions like *wherever you put yours* since they can in fact occur as objects of overt prepositions:

(21) a. I'll move to wherever you want to live.

b. John got the tapes from wherever he keeps his books.

c. I'll stay here until whenever Denise asks me to join her.

The expressions that can be regarded as NPs allow restrictive relatives and thus **must** be treated as NPs:

(22) a. I'll move to wherever you want to live that isn't too far from Boston.

b. I'll word my reply however I can that won't offend them.

c. John will be however deceitful his clients want him to be that won't get him disbarred.

I find it much harder to argue for any particular analysis for simple free relatives than for *-ever* free relatives and will accordingly leave their analysis up in the air beyond the tentative conclusions that were drawn above about their surface constituent structure. Bresnan and Grimshaw (1978) offer an analysis in which the deep structure is roughly the same as that surface structure, with the Wh-expression controlling the deletion of an item (denoting a corresponding bound variable) in the embedded S, and such an analysis is at least as viable as any alternative that I am aware of, though it leaves unexplained (as did the analysis of *-ever* free relatives sketched above) the fact that the Wh-elements are those which otherwise serve as interrogative rather than relative pronouns.

d. Some clause types that look like relative clauses

There is a class of cases in which what appear at first glance to be restrictive relative clauses behave more like cleft clauses (2a) than restrictive relatives (2b) with regard to placement of parenthetical expressions:

(1) a. There are many Americans, of course, who distrust politicians.

b. Paul has a brother, incidentally, who lives in Toledo.

c. Nixon is the only President, as you know, who ever resigned.

d. I've never met an American, by the way, who didn't like pizza

(2) a. It was Fred, incidentally, who asked John for help.

b. ??I was just talking to the person, incidentally, who asked John for help.

The apparent relative clauses in (1), which I will henceforth refer to as **pseudo-relative clauses**, also differ from ordinary restrictive relatives with regard to a constraint (the Complex NP constraint, to be taken up in chapter 15) that excludes extraction of material from a relative clause construction:

(3) a. *Which books did John praise the person who wrote Ø?

b. *What corporation is Nina the lawyer who represents Ø?

While sentences in which material is extracted from pseudo-relative clauses often sound somewhat odd (4), they generally sound far more normal than examples as in (3) in which material is extracted from ordinary restrictive relatives, and extractions from pseudo-relatives occur far more often in ordinary speech than do extractions from ordinary restrictive relatives (5):

(4) a. ?Which persons do you think there are many Americans who distrust Ø?

b. ??What company does John have a brother who works for Ø?

c. ?How many exam papers is Smith the only instructor who hasn't read yet Ø?

d. Which foods have you never met an American who doesn't like Ø?

(5) a. This is the one that Bob Wall was the only person who hadn't read Ø. (Unidentified University of Texas secretary, observed by Susan Schmerling)

b. Then you look at what happens in languages that you know and languages that you have a friend who knows Ø. (Charles Ferguson, lecture, May 1971)

continues at bottom of p. 449

c. It's a distinction which I'm sure I'm the only person in the world who has Ø. (Howard Aronson, 31 May 1984)

9 ~~PSEUDO-RELATIVES~~ The examples of pseudo-relatives given ~~in #13a~~ have the following characteristics: (i) the apparent relative clause is final in

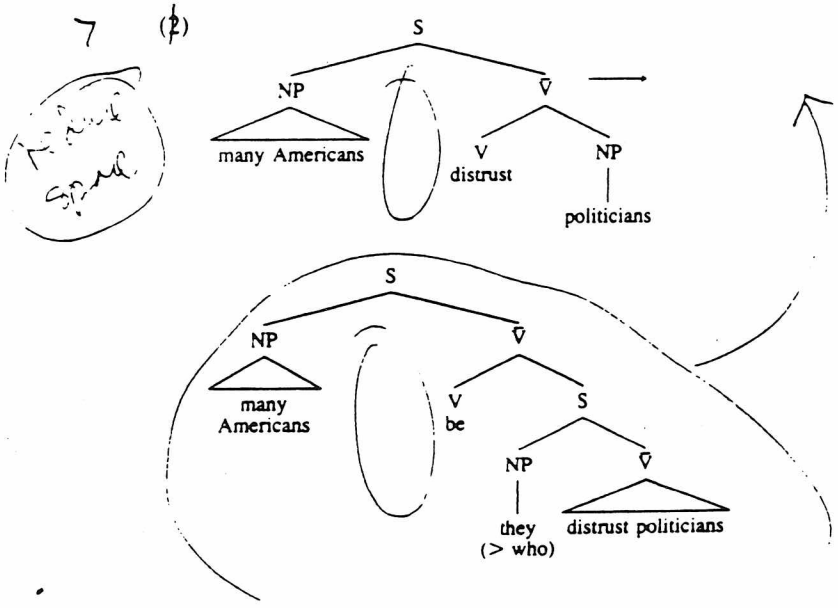
its host S, and (ii) the sentence can be paraphrased by an existential (or negated existential) sentence whose main clause corresponds to the apparent relative clause:

(1) a. There are many Americans who distrust politicians.
a'. Many Americans distrust politicians.
b. Paul has a brother who lives in Toledo.
b'. A brother of Paul's lives in Toledo.
c. Nixon is the only president who has ever resigned.
c'. Aside from Nixon, no president has ever resigned.
d. I've never met an American who understood cricket.
d'. In my experience, no American has ever understood cricket.

I will not attempt to work out an analysis of pseudo-relatives in this book, since I have brought them up in this chapter only to alert the reader to their existence and to some differences between them and true restrictive relatives, so that we can guard against wrongly drawing inferences about restrictive relatives from facts about another clause type with which they are easily confused.

I in fact wish to suggest tentatively that pseudo-relative constructions have the same deep structures as do paraphrases such as are given in (1) and that a transformation demotes the bulk of the main clause to a subordinate status, leaving the quantified NP as a main clause constituent:

(2)



It is in fact quite difficult to work out such an analysis in detail, since the inserted V is not always *be* and the quantified NP is not always the (underlying) subject; thus, clearly more than is present in the deep structure in (2) is necessary to determine what the verb of the derived structure is. I maintain, however, that such a derivation has two important advantages over the most obvious alternative, namely, that of just treating pseudo-relatives as if they were restrictive relatives. First, ~~in §13a~~ it was shown that ~~in several respects~~ the pseudo-relative is "less tightly connected" with the preceding NP than restrictive relatives are with their heads, and a derivation as proposed in (2) provides a derived structure in which the pseudo-relative is outside the preceding NP. And second, Prince (1981:247) has noted that omission of a subject relative pronoun, which is normally not allowed in modern English, is extremely common in a class of cases that appears to coincide with what I call pseudo-relatives here (examples adapted from those cited by Prince):

(3) a. I have a friend ∅ called me yesterday.
b. We got a lot of fancy Cadillacs ∅ don't tip. (Terkel, *Working*, 298)

Indeed, Prince states that "In [Anthony Kroch's] large corpus of oral discourse, **all** instances of subject relative marker deletion occur in sentences like those of [(3)]." The surface form of sentences like those in (3) is in fact essentially the same as that of a class of Chinese sentences that are used the way that English pseudo-relatives (Huang 1987) are but which are not open to an analysis as relative clauses because in both form and surface position they are unlike relative clauses:

(4) Wo you yige didi zhuzai Shanghai.
I have one brother live-at
'I have a brother who lives in Shanghai'.

In Chinese, relative clauses always precede their heads and end with *-de*, unlike the underlined part of (4). In the analysis suggested here, pseudo-relatives can be treated as parallel to their Chinese counterparts, with the use of a relative pronoun being merely a device that (in English but not in Chinese) gives the pseudo-relative clause the surface appearance of a "normal" clause type.

INFINITIVAL RELATIVES In the analysis suggested in §13a, infinitival relatives differ in deep structure from (finite) restrictive relatives only in having a *for-to* complementizer instead of a *that* complementizer. That

c. It was only reluctantly that he agreed to swim the channel. (Adv focus)

The contrastive negation of (13a') and the *only* of (13c) often raise the acceptability of particular foci.

There are several respects in which cleft Ss behave as if the focus and the relative-like clause are a constituent. For example, such a combination can be deleted by V'-deletion, it can undergo Right-Node-Raising, and it can appear conjoined with another such combination in the output of Conjunction Reduction (examples once more from Delahunty):

(14) a. It wasn't Bill that seduced Mary, although her father is convinced that it was Ø.

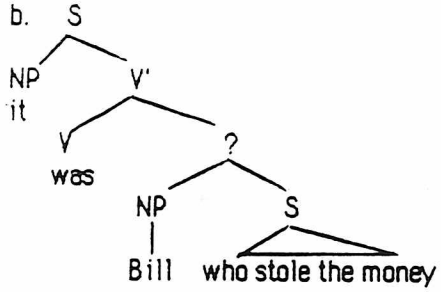
b. It could have been, and it probably was, Bill who negotiated the new contract.

c. It must have been Fred that brought Mary to the party but Bill that left with her.

Since the diverse constituents that can be the focus share no internal structure, and indeed can be units that do not have any internal structure (15a), the only way that cleft Ss could have the same constituent structure and have the focus and the relative-like clause make up a constituent would be for the constituent structure to be as in (15b), with the focus and the S being sister:

(15) a. It was I who chopped down the cherry tree.

b.



The constituent structure suggested in (15b) makes the connection between the focus and the relative-like clause sufficiently "loose" as to make the position between them an appropriate niche for parenthetical expressions. That constituent structure is also what would be obtained if the relative-like clause were an underlying subject complement and got into its derived position through Extraposition. This latter observation provides the motivation for a popular treatment of cleft Ss as variants of **pseudo-cleft** Ss such as (16), in which a counterpart to the relative-like clause of the cleft S is in subject position — extraposition of the sentential subject of a pseudo-cleft would yield a derived structure as in (15b):

As was pointed out at the beginning of this section, the looseness of the connection of pseudo-relative clauses with their supposed heads is a characteristic that they share with another construction containing an apparent relative clause, namely **cleft** sentences, to which I now turn. The apparent relative clause of a cleft sentence shares with restrictive relatives the alternation among relative pronouns, *that*, and zero, though the possibility of a relative pronoun is sharply restricted:

(10) a. It was John who/that/Ø I talked to.

b. It was a pipe-wrench that/Ø/?which Mary bought.

c. It was Tuesday when/that/Ø I received your letter.

d. It was out of spite that/?Ø/*why Bill broke the window.

In particular, except where it is a possessive, the relative pronoun cannot pied-pipe other parts of a P' or a NP in which it is contained:

(11) a. It was to John that/Ø I talked.

a'. *It was to John to whom I talked.

b. It was John whose brother was arrested.

b'. *It is John nasty rumors about whom I keep hearing.

There is a broad range of possibilities for the **focus** constituent of a cleft sentence. Examples have already been given where it is a NP (10a-c) or a P' (10d, 11a), and Delahunty (1982:106-7) notes that even predicative NPs, and even P's with a sentential object, can serve as the focus:

(12) a. It is a gourmet cook that George wants to become.

b. It was before we left that Mary and Bill got into one of their awful rows.

There is considerable individual and dialect variation with regard to what types of focus constituents are allowed, with Irish English being especially permissive, but examples like the following (taken again from Delahunty) are accepted by many speakers:

(13) a. It's nude that Sandy prefers to swim. (A' focus)

a'. It wasn't quite depressed that he appeared that day, just slightly sad.

b. How long was it that we stayed under water? (measure expression focus)

(16) a. What John brought was a bottle of champagne.

b. What I like to do is take long walks.

One major problem with that suggestion, though, is the same problem that arose in connection with free relatives: the embedded S in the surface form of examples as in (16) is not "relative-like" but more like that of an interrogative complement — it contains an apparent interrogative pronoun and does not have an alternative form with *that* or zero.

•more•

EXERCISES

1. Give derivations for the following sentences according to the analyses adopted so far in this book:

a. The speaker punched the obnoxious heckler who had insulted him.

b. Expensive furs, which are hard to identify, are stolen frequently.

c. We have identified the gangster by whose henchmen Smith was murdered and Jones was tortured.

d. Ken bought some toys with which to amuse the children.

e. I've found a pad to write on that has wide margins, which most pads don't have.

f. I want to buy whatever books you have that were given good reviews by Buckley.

2. a. There is considerable overlap between the words that function as interrogative pronouns and those that function as relative pronouns in English (e.g. *who, when,* and *where* can be used either way). Determine how far this parallelism goes, i.e. find which words can be used both ways and which words, if any, can be used in one of these functions but not the other.

b. Determine which of the words that you dealt with in exercise 2a can introduce free relatives.

3. Use facts about conjoining and RNR to determine whether the various kinds of relative and relative-like clauses that were not taken up explicitly in §13b also have a surface structure like §13b(1b).

4. Jespersen (1924:113) applies the term 'continuative relative clause' to examples like the following:

He gave the letter to the clerk, who then copied it.

Determine what properties such relative clauses have in common with restrictive or nonrestrictive relatives such as were discussed in this chapter.

5. Construct an argument for treating *what* as derived from a structure containing *something*, on the lines of the arguments based on §13a(26), using facts about the expression *the matter with*, as in *Something is the matter with you*.

6. Using examples comparable to those in §13c in which free relatives supported restrictive relative clauses, check whether free relatives can be modified by reduced relative clauses.

7. NPs like the following illustrate an additional class of relative clauses (over and above those in

which a subject NP is relativized) in which *that* cannot be deleted:

a suggestion that recently John made

a drastic measure that under certain circumstances we had to resort to

Suggest what the restriction on deletion of *that* is, construct additional examples that will test the correctness of your proposal, and state whether this restriction and the restriction against deleting *that* from [$_S$ *that* "V] can be subsumed under a single restriction.

8. Do the analyses argued for in this chapter imply that English should allow infinitival free relatives? (Note: Infinitival free relatives are found in Spanish, e.g. *Yo tengo con que pagarte*, literally 'I do not have [with which to pay you]').

9. a. Examine a selection of the combinations in which restrictive relatives can occur (e.g. extraposed, stacked) to see whether there are any combinations in which *that* cannot be deleted (i.e. contexts in which ... *that/who / talked to* is possible but ... */ talked to* is not).

b. Under certain conditions, *that* may be omitted from a *that*-complement. Determine whether the restrictions on the omission of *that* from relative clauses that you found in exercise 6a can be interpreted in such a way that they also apply to its omission from complements. [NB: exercise 7 is concerned with restrictions on the **internal** syntax of relative clauses from which *that* is deleted, while exercise 9 is concerned with restrictions on their **external** syntax.]

NOTES

1. Since personal pronouns must generally be taken to be unspecified for person, number, and gender in deep structure (S11f), this means that for all practical purposes what underlies the pronoun **is** a referential index.

Alternatively, the indices on the N' and the pronoun can be taken always to be a variable; that variant of this analysis would amount to interpreting the [N' S] combination in terms of the 'abstraction operator' λ, e.g. *person that knows Diane* would be interpreted as (λx)(x is a person Λ x knows Diane), i.e. as 'the property of being a person and knowing Diane). (An expression '(λx) S' means 'S, treated as a property of x'.) The λ-notation is heavily exploited in Montague grammar; see e.g. Dowty, Wall, and Peters 1981:98-110.

In that alternative, which is developed in McCawley (1981a,b), the index that is on the N's in (13) appears instead as the subject of a predicate N' in a S conjoined with the one that underlies the relative clause, e.g. in (13) *every* would be combined with [$_S$ [$_S$ x is (a) reporter] and [Agatha talked to x]]. Relative clause formation would then involve a step in which the second conjunct of such a structure was adjoined to the predicate N' of the first conjunct; the resulting [$_S$ x is (a) [$_{N'}$ N' S]] structure would then have to undergo a transformation that reduced it to its predicate N'.

2. Note that in rejecting Chomsky's conclusion that movement of relative pronouns is 'successive cyclic' I am not rejecting the conclusion that it is cyclic (as opposed to post-cyclic). I reject as flawed the arguments that have occasionally been given (e.g. McCawley 1970) for the conclusion that the various kinds of Wh-movement are postcyclic.

3. In view of the conclusions of §6c, the domain to which Relative pronoun formation and Relative pronoun movement apply is not S_0 but rather the [$_{N'}$N' S_1] constituent.

4. There is considerable dialect variation with regard to whether this restriction is operative. It was not observed in Old and Middle English and is not observed in American urban Black English.

5. In this section I am taking up only the question of constituent structure, i.e. I am ignoring the question of whether the two constituents labeled S in (1b) do in fact belong to the same category.

6. The output of RNR is given here in accord with the conclusions of §16a, where it is argued that the 'raised' constituent actually remains a daughter of whatever nodes it had been a daughter of, so that the output is a discontinuous structure in which that constituent has multiple mothers.

7. There is an acceptable interpretation of (23c) in which *nobody* does not have the meaning and syntactic function that it has in (22c) but functions as a noun meaning 'person who is not of any importance'.

8. A qualification must be made for the *every-* of *everybody*, etc., which is ambiguous between the senses of *every* and of *all*. Note that words of the *every-* series can be used even in contexts that allow *all* but not *every*:

Köchel compiled a catalog of everything that Mozart wrote.

*Köchel compiled a catalog of every work that Mozart wrote.

Köchel compiled a catalog of all of Mozart's works.

Everyone is alike.

*Every linguist is alike.

All linguists are alike.

9. Chomsky (1964:69-70) and Katz and Postal (1964:93-4) use examples like (25a-b) as the basis of arguments that the underlying structures of interrogative words contain the corresponding *some*-words.

10. The inserted article is not always indefinite, e.g. I would posit insertion of a definite article in *Scott is **the** author of Waverley.* The article that is inserted is the one that would be less misleading if it were given its normal semantic interpretation. See Pentheroudakis (1977) for detailed discussion of a language (Modern Greek) that draws a 3-way distinction among article-less NP, indefinite NP, and definite NP, with the article-less NP generally corresponding to English NPs with a semantically empty indefinite article.

A third possible analysis of relative clauses on predicate NPs, which is defended in McCawley 1981b but will not be pursued further here, is to treat predicate NPs as having no underlying articles, derive relative clauses on predicate NPs from underlying coordinate structures (e.g. derive (44a) from a structure *[John; be lawyer and he; wins every case]* by adjunction of the second conjunct to the predicate N' of the first conjunct) and treat non-predicate N's as corresponding to deep structure [$_S$ x be N'] constituents. Since conjoined Ss are possible wherever simple Ss are, the latter part of this proposal would automatically make available deep structures in which the [$_S$ x be N'] was conjoined with a S such as would underlie a relative clause on a predicate N' and would thus provide derivations for relative clauses on non-predicate NPs.

11. See §22c for a more protracted discussion of patches.

12. Yet another argument for deriving relative pronouns from underlying personal pronouns is suggested by the observation of Kuroda (1968:§5) that certain NPs that cannot normally be replaced by pronouns likewise do not correspond to relative pronouns:

(i) a. Tom died on Christmas, and Roger died then too.

a'. *Tom died on Christmas, and Roger died on it too.

b. the day when Roger died

b'. the day *which/??that/??Ø Roger died on

(ii) a. *John spoke in an unpleasant manner, and Mary spoke in it too.

a'. the manner which/that/Ø Mary spoke in

(iii) a. *John refused for a stupid reason, and Mary refused for it too.

a'. *the reason which/that/Ø Mary refused for

Under the proposal that personal pronouns underlie relative pronouns, the anomaly of (ia', ib', iia, iiia) would be reflected in a corresponding anomaly in examples such as (ia, ib, iia', iiia') whose underlying structures would involve such personal pronouns. The argument, unfortunately, cannot be maintained, in view of the considerably greater acceptability of some relative clauses whose personal pronouns are quite anomalous (iv) and the acceptability of examples in which the relative pronoun is pied-piped (v):

(iv) a. *John lives in Boston, and Mary lives in it too.

a'. the city which/that/Ø Mary lives in

(v) a. the day on which Roger died

b. the manner in which Mary spoke

c. the reason for which Mary refused

d. the city in which Mary lives

Since the proposal that personal pronouns underlie relative pronouns does not distinguish between cases in which there is pied-piping and cases in which there is not, it does not provide any account of why the anomaly of (ia') etc. is not shared by (v).

13. Instead of 'target' I could as well have used the term 'host', except that it will prove more useful to reserve the latter term for the S within which the nonrestrictive clause appears. In view of the observation in §7c that extraposed Ss are NPs on only one of the dimensions of NP-hood taken up there, the antecedent in (16c) is only loosely speaking a NP.

14. A further difference between restrictive and nonrestrictive clauses, though one whose implications will not be completely clear until the relationship of syntax to intonation and rhythm

is better ubderstood, is in the acceptability of sentences in which a parenthetical expression breaks up the construction:

i. *Fred was just talking to the person incidentally who asked John for help.

i'.*Dorothy arrived on the day of course when I was in Toledo.

ii. ?Fred was just talking to Mary, incidentally, who asked John for help.

ii'. ?Dorothy arrived on Wednesday, of course, when I was in Toledo.

It at least is plausible to take this difference as evidence that nonrestrictive clauses are 'less tightly' connected to the preceding material than are restrictive clauses. With cleft clauses, which presumably do not have any connection with the preceding constituent (the predicate constituent), there is not even the mild awkwardness that one finds in examples like (ii-ii''):

iii. It was Fred, incidentally, who asked John for help.

iv. It was Wednesday, of course, when I was in Toledo.

15. It will be convenient to introduce the term **neighbor** for a constituent that is immediately adjacent to a given constituent, i.e. two constituents are neighbors if one precdes the other and ther is no constituent that follows the one and precdes the other. Emonds' constraint can then be restated as a requirement that every nonrestrictive clause be a surface neighbor of its target. We might indeed generalize Emonds' proposal to a universal constraint that all adposits be surface neighbors of their targets, though I know of so few clear cases of adposition that I cannot make that suggestion with much confidence.

16. These examples and most that follow are from Bresnan and Grimshaw (1978).

17. While *what* in standard English does not function as a relative pronoun, its German and Russian counterparts do when the head is an indefinite pronoun:

everything which/that/*what he said

alles, <u>was</u> er sagte

vše, <u>čto</u> on skazal

18. Conceivably one could analysis *as*-comparatives as relative clauses such as one might expect to be expressed with *how* as a degree expression, e.g. *My lawyer was <u>as nasty as their lawyer was</u>* would involve a relative analog to *How nasty was their lawyer?* Note e.g. that in some languages

the same word (e.g. German *wie*) is used both for interrogative *how* and for the *as* that introduces the 'standard of comparison'.

19. What is at issue here is interpretations in which the parenthesized expressions are restrictive relatives. Not surprisingly, the analog to (1c') in which that expression is a nonrestrictive clause is perfectly normal. To my knowledge, the possibility of restrictive relatives modifying free relatives was first noted in Weisler (1980).

20. With regard to one Wh-word, *-ever* free relatives diverge from both interrogatives and restrictive relatives, in that *why*, which both the latter allow, is excluded:

I asked why he had called me.

the reason why he called me

*I'll lend you money whyever you want me to. (cf. ... for whatever reason...)

21. Note that (20b-c) involve what is referred to in §22a as "Telescoping", e.g. the relative clause in (20b) means not 'that way won't offend them' but 'wording the reply that way won't offend them', and the one in (20c) means not 'that degree of deceitfulness won't get him disbarred' but 'being deceitful to that degree won't get him disbarred'. The possibility of Telescoping here is not restricted to free relatives, since it is also seen in paraphrases with restrictive relatives:

I'll word my reply in any way that I can that won't offend them.

John will be deceitful to any degree that his clients want him to be that won't get him disbarred.

24. This implication may be a liability rather than a virtue, in view of the extent to which a *that* is acceptable in such examples as (Bresnan and Grimshaw (1978:346)):

Whatever food that there may be in that pantry is probably infested with moths.

1. This restriction relates only to proper nouns that are used as proper nouns. When a proper noun is used as a common noun, it can support a restrictive relative as well as any other noun can:

The Harry Smith who took your phonetics course last year has transferred to Cornell.

2. The term 'stacked' is used for multiple relative clauses that have the same head. The statement that nonrestrictive clauses cannot be stacked thus does not exclude sequences of nonrestrictive clauses in which each after the first modifies something in the preceding clause:

Sam Bronowski, who took the qualifying exam, which almost everyone failed, did brilliantly on it.

8. This will result in a discontinuous structure if the target is not at the end of the sentence, a fact that should not alarm one. The question of what exactly underlies nonrestrictive clauses is ignored here. In §13c I will argue that the nonrestrictive clause corresponds to an underlying S containing a constituent coreferential with the target constituent.

•add to note 8•

The label 'S' at the top of this structure, and indeed the node bearing that label, are fudges motivated by a desire to avoid temporarily a digression into the question of whether the nonrestrictive clause and its host even make up a syntactic unit, and if so, what the syntactic category of that unit is. They clearly make up some sort of unit, but it might be a unit of action rather than strictly speaking a **syntactic** unit — note in this regard the point made in §13c that the nonrestrictive clause and its host correspond to separate speech acts.

9. This argument for treating *that* in relative clauses as a complementizer rather than a relative pronoun is due to Jespersen (1924:85-6).

12. An exception to this statement, namely relative clauses containing a so-called 'resumptive pronoun', will be taken up at the end of this subsection.